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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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British Overseas Trading Methods

FROM a highly qualified industrial chemist and chemical engineer, in charge of an important Government chemical works in India, we have received a communication of great interest in its bearing on British overseas trading methods. We publish it as deserving the attention of every manufacturer and exporter of British chemicals and chemical plant. "We desire," our correspondent writes, "to bring to your notice a certain amount of difficulty we experience when we send out inquiries to England for machinery, etc. At the risk of being a little lengthy and tiresome we should like to put the case frankly. Perhaps an example will make our point more clear. Recently some oil millers in our State turned their attention towards 'hydrogenation' and wanted to have as complete information about plant and costs as possible. Some inquiries were sent out both to U.S.A. and England. All possible local information had been supplied to the firms who were approached. Even though U.S.A. is farther away from us than England, replies came quicker from America than from England. That is not all. The American firms had worked out in great detail, from data furnished as to local conditions, the cost of production per cwt. of hydrogenated oil, by using the plant and process they recommended. Further, the precise way in which the recommended plant and process were superior to others in the same field was clearly pointed out. The specifications for the plant were in greater detail. The usual catalogues, blue prints, pamphlets, references to scientific literature, etc., were all supplied."

In contrast with the American makers' methods, it is a little disappointing to learn that "the English firms were a little more dilatory. They sent very polite replies indeed, and quoted for the plant and furnished the general specifications. They offered to supply further information if necessary. The British firms left the impression that they are cold, reserved, and polite, and withhold as much information as possible. The American engineers left the impression that they are warm, enthusiastic, and want to give us all the information possible and to help the inquirers in every way. Permit us, by way of parenthesis, to state that we are not trying to use the conventional attributes of two English-speaking nations. We based our revised estimates, etc., on information supplied by American engineers.

"One more point we wish," our correspondent concludes, "to bring prominently before you is that, so far as conditions in Southern India are concerned, it is just possible that not more than 5 to 10 per cent. of the inquiries will result in business. This is due to the industrial backwardness of the country. A man with money to invest in an industrial enterprise will try to collect information on a number of different industries and make a final choice. The final decision may take a considerable amount of time. You will thus see that chemical engineering firms who supply the information may have to wait for quite a long time. Permit us also to mention that information will often be sought from all western countries who are in a position to supply the things wanted. We thought the above remarks might be of some use to chemical engineering firms who handle overseas inquiries, and you are at liberty to publish them."

A Good Start

MR. F. H. CARR, the new president of the Society of Chemical Industry, has made an excellent beginning in his visitation of the local sections. His address to the Manchester Section last week on "The position and prospects of the heavy chemical industry in this country" was a sound and exhaustive review of the subject; its only defect, in fact, was in its merit, namely, that it contained almost too much matter to be instantly absorbed. In dealing with the part that chemical engineering plays in the establishment of new processes, Mr. Carr returned to a subject to

which he had previously drawn attention. Both the engineer with an adequate perception of the niceties of the arrangements required from the chemist's point of view and the chemist with that well-developed engineering sense by which alone the gap between laboratory and works practice can be bridged are hard to find, and the need of the moment is for a larger proportion of men with this knowledge and ability. Another point of growing importance is the need of more concentrated manufacture of special products in quantity. For this a greater degree of mutual confidence and co-operation among chemical manufacturers is obviously necessary, and fortunately the tendency is gradually setting in in that direction. If Mr. Carr keeps up the standard he has set in his first address, his year of office should be of great educational value to all engaged in chemical industry.

German Fuel Research

To the notice published in our last issue of the new Overseas Trade Department's review of the financial and economic conditions in Germany, a few notes remain to be added, especially in relation to fuel research. It is no surprise to learn from the report that the importance of research work continues to be well appreciated and that there is a continuous and logically directed investigation into the production of oils and fuels from coal and coke by the methods of liquefaction and synthesis. The experiments of Bergius are already well known. Professor Fischer, of the Kaiser Wilhelm Institute for Coal Research, is reported to have achieved certain initial successes in the synthesis of liquid fuels from the gasification products of coal and coke under comparatively low temperatures and pressures. Concurrently, the Dye Trust, which has gained exceptional experience in high-pressure technology, notably in the sphere of the manufacture of synthetic nitrogen, is also engaged very actively in research work upon the production of liquid fuel by catalytic action, and has already attained definite success in the production of synthetic methyl alcohol from water gas and hydrogen, which process has now for some time been operating on a commercial scale. Whilst it is too early yet to speak of practical successes in these fields of investigation, the intensive investigations carried out have certainly gone to pave the way for a future solution, and the results have enabled research to be guided into channels offering some promise of success.

It has been stated by Dr. Spiller at the annual meeting of the Association of German Chemists that it has now been decided to lay out in the Ruhr the first large installation utilising the Bergius process, and it would appear that the continued researches carried out upon the constitution of lubrication oils have renewed hope that the hydration of coal and tars holds out prospects of commercial success in the production of lubricant and lighter fuels. From time to time rumours are current that, now in one direction, now in another, success has been achieved or that scientific investigations have advanced to the point of emerging from the laboratory and being applied on a practical scale. These rumours may prove unfounded or exaggerated, but the work of research goes steadily on, and the scope of inquiry becomes increasingly widened by the added resources which this interesting field of study is constantly attracting.

Of the position of the German coal tar industry no very detailed figures are given, but the following table gives the production of tar products from the coke oven industry :—

			By-products.		
Year.	Coal used for Coke Production. 1,000 tons.	Coke Production. 1,000 tons.	Tar and Tar Compounds. 1,000 tons.	Benzol. 1,000 tons.	Sulphuric Acid, Ammonia and other Ammonia Compounds. 1,000 tons.
1913	44,198·7	34,630·4	1,152·8	194·4	456·4
1922	37,708·5	30,225·1	960·4	218·7	397·9
1923	17,404·3	14,070·6	447·0	101·0	174·4
1924	29,507·1*	23,719·5*	753·5*	166·0*	308·3*
1925 Jan.-Sept.	25,315·2*	20,349·9*	646·5*	142·4*	264·5*

* Estimates.

The Work of the Public Analyst

THE annual report of the Salford borough analyst (Mr. G. D. Elsdon, B.Sc., F.I.C.), which has just reached us, is an excellent illustration of the part the analytical chemist plays as a guardian of the public health. Although, as the result of his vigilance, gross cases of adulteration and misdescription are now comparatively rare, a considerable amount of minor adulteration is still found to exist, and food substances are offered that do not chemically correspond with the fancy or alluring trade titles given to them. In the opinion of Mr. Elsdon, the taking of "informal" samples is a valuable method of inquiry into the food supply of a district. It serves to indicate the quarters where it might prove profitable to take "formal" samples, while the time and trouble involved are much less than in the case of a "formal" sample.

Some idea of the extent of a borough analyst's work may be gathered from the fact that in Salford during the eleven years 1915-25, 16,628 samples have been examined in the borough laboratories. Of the 14,786 taken under the Food and Drugs Act, 839 were returned as adulterated, giving an adulteration percentage of 5·7. In enforcing the existing laws, it is pointed out that the defence, which is frequently well organised and always so where matters of fundamental importance to the trade are concerned, has often large sums of money at its command and is prepared to risk amounts outside the capability of any but the largest local authorities. Even the latter, however, are not always keen on risking the equivalent of a penny rate for a result which, if favourable, other authorities would equally benefit by. The difficulties in enforcing the law are mainly two—first, the difficulty of getting witnesses to testify as to standards from the public standpoint; secondly, the cost of appeals to the High Court. The first, it is suggested, might be overcome by fixing a minimum standard for all foods or by requiring a label to be placed upon every article describing its ingredients and their approximate proportions. The second difficulty might be met by the establishment of

a common fund by local authorities which would be available for use in appeal cases of general interest. With a food standards committee and a fund for fighting appeals, Mr. Elsdon's confident view is that "the food supply of this country could be enormously improved in a short time."

There is much interesting detail in the report concerning particular food substances. "Jam" in certain instances, it would appear, becomes little more than a courtesy title. It is rather more disturbing to read that "it is no exaggeration to say that the present position of the flour-milling industry in England should not be tolerated in any civilised country," that "a very large percentage of flours now contain persulphates, peroxides, and other compounds allied to the so-called 'oxygen' compounds used in the modern laundry," and that "the bulk of the flour sold in this country to-day is seriously adulterated to the great detriment of the purchasing public." Of abstemious habits ourselves, we do not like to hear that "probably in no branch of food is there more adulteration than in that of the so-called temperance drinks, fruit cordials and similar preparations"; such unfeeling verdicts weaken the defences against the cocktail habit. Similarly, those who fortify themselves with medicated wines may not be pleased to learn that these heartening beverages may be "either valueless or of much less value than can be obtained by the expenditure of an equal amount of money on the more usual foods." The most disputatious ought to agree that custard should be prepared from eggs, and that the name "custard powder" is a misdescription of a substance consisting merely of coloured and flavoured starch; also, that "merely coloured baking powder" christened "egg powder" cannot be accepted as a substitute for eggs, even when supported by pictures of cocks and hens. We have already acknowledged the importance of the public analyst's work. There must, we should judge, be possibilities of entertainment in it also.

The Five-Day Week

CONSIDERABLE attention has been drawn to the recent announcement by Mr. Henry Ford of his intention to introduce the five-day working week throughout his works. It has been treated as almost a revolutionary suggestion; yet in this matter the progressive Mr. Ford is actually behind existing industrial practice in this country. THE CHEMICAL AGE and its associated journals have for quite a long time been produced on the five-day week, and the parent company of Benn Brothers, Ltd., in the foundation or acquirement of associated concerns, have applied the system to all their undertakings. In this matter, as in many others, we may claim to have been the pioneers of new industrial ideas, considerably in advance of the times, and it is pleasant now to find so far-sighted an industrialist as Mr. Ford recognising the merit of an idea which our own firm ventured to introduce some years ago. It was our hope at the time that the example would be widely followed; but industrial conservatism is not easily broken down, and for that reason we welcome Mr. Ford as a powerful convert to an idea that we were among the first to introduce in this country.

A Chemical Portrait Gallery

THE Chemical Society is to be congratulated on its enterprise in publishing a series of fine portraits of eminent chemists (reproduced by a photo-lithographic process) and two volumes of memorial lectures on eminent chemists delivered from time to time before the Society. The portraits are all good and especially suitable for the walls of colleges, clubs, etc., as well as for the private "dens" of chemists. The series includes the following representative subjects:—R. W. Bunsen, Emil Fischer, A. W. von Hofmann, D. I. Mendeléeff, L. Pasteur, Sir William Perkin, Sir William Ramsay, and Sir Henry Roscoe. The memorial lectures are of permanent interest and many will desire to have the complete set in two volumes, priced respectively at 10s. 6d. and 8s. The price of the portraits is 3s. each, or 22s. the set.

The Calendar

Oct. 11	Ceramic Society: "Ignition of Gases." Professor H. B. Dixon. 7.30 p.m.	Central School of Science and Technology, Stoke-on-Trent.
11	Institute of Metals (Scottish Section): Chairman's Address—S. E. Flack. 7.30 p.m.	39, Elmbank Crescent, Glasgow.
12	Institution of Petroleum Technologists: "The Significance of Surface Oil Indications." A. Beeby Thompson. 5.30 p.m.	House of the Royal Society of Arts, John St., Adelphi, London.
12	Institute of Metals (Birmingham Section): Chairman's Address—Arthur Spittle. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
14	Institute of Metals (London Section): Chairman's Address—A. H. Mundey. 7.30 p.m.	83, Pall Mall, London, S.W.1.
14	Institute of Chemistry (Liverpool and N.W. Section):	St. George's Restaurant, Redcross St., Liverpool.
15	Institute of Metals (Swansea Section) Chairman's Address—Capt. L. Taverner. 7.15 p.m.	Metallurgical Dept., University College, Singleton Park, Swansea.
15	Society of Dyers and Colourists (Manchester Section): "Some Problems in Modern Calico Printing Technique." J. R. Hannay. 7 p.m.	36, George Street, Manchester.
21	Chemical Society: 8 p.m.	Burlington House, Piccadilly, London.
22	Institute of Metals (Sheffield Section): A conjoint meeting with other societies interested, for the Sorby Lecture by Professor H. C. H. Carpenter. 7.30 p.m.	The University, St. George's Square, Sheffield.
28	Chemical Society: Hugo Müller Lecture by Professor S. P. L. Sorensen. 8 p.m.	Institution of Mechanical Engineers, Storey's Gate, London.
28	Institute of Metals (Birmingham Section): "Fatigue." Professor D. Hanson. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
29	Institute of Chemistry (Glasgow and West of Scotland Section): Annual General Meeting.	
30	Institute of Metals. (North-East Coast Section): Joint meeting with the Institute of British Foundrymen. 6.15 p.m.	Neville Hall, Newgate Road, Newcastle-on-Tyne.
Nov. 5	Society of Chemical Industry (Manchester Section). Joint meeting with the Manchester Sections of the Institute of Chemistry and the Society of Dyers and Colourists and the Manchester Literary and Philosophical Society. "The Chemistry of Cellulose." Dr. Lilienfeldt.	Manchester.

Position and Prospects of the Organic Chemical Industry

Comprehensive Survey by Mr. F. H. Carr

THE first meeting of the 1926–1927 Session of the Manchester Section of the Society of Chemical Industry was held at the Textile Institute on Friday, October 1, Mr. L. Guy Radcliffe being in the chair. Mr. Francis H. Carr, C.B.E., F.I.C., the President of the Society, delivered an address on "The Position and Prospects of Organic Chemical Industry in this Country."

Mr. Carr said there was, of course, no fast boundary between the organic and the inorganic chemical industries. There were, however, many aspects of chemical manufactures requiring the application of a knowledge of organic chemistry which distinguished it quite clearly from other sections of chemical industry.

Historical

The manufacture of dyestuffs and the isolation and purification of many naturally occurring substances, such as quinine, morphine, and strychnine, were instances of organic chemical manufacture in which at their inception we in England took the lead. It was during the last two decades of the nineteenth century that the development in this country of chemical manufactures calling for the exercise of knowledge of organic chemistry realised so much less advance than it did in certain parts of the Continent. It became apparent to many that we were not maintaining the lead in the newer chemical industries which we had played so important a part in establishing. The total number of people engaged in chemical industry underwent very little increase during this period, and was but a fraction of what it was to-day. New departures in organic chemical manufacture were continually being made at this time in Germany, and keen competition arose in the selling price of most of the products which were manufactured here, causing serious embarrassment to our trade. Thanks to the efforts of a few stalwarts we never entirely lost grip, however, notwithstanding unequal conditions.

It was not until the first decade of this century that any alteration began to take place in the desperate situation which had arisen. The statement frequently reiterated that the amount of organic chemical manufacture remaining here in 1914 was negligible was, of course, an exaggeration. During the years 1900–1914 the number of workers engaged in chemical industry had been doubled. There were no figures to show how many of the additional workers were engaged in organic chemical manufacture, but it must have been a considerable number, for in many respects the situation had very much improved.

Nevertheless, the position at the outbreak of war was still such that an immense effort was called for on the part of the nucleus of organic chemical manufacturers which then existed to maintain supplies of those dyestuffs, medicinal chemicals, and flavouring agents which up to that time we were continuing to import. In response to this call a much greater virility was displayed than many had supposed to exist, and in point of fact almost every demand was met, in spite of the bare minimum of resource in materials, plant, and personnel which was available.

Why We Lost the Lead

Mr. Carr then proceeded to discuss the reasons why we lost the lead in organic chemical manufacture and retained it in heavy chemicals. He said that "efficiency" was a hackneyed word of which one was apt to become a little tired, and yet it was the word which best described the varied means by which the foreigner wrested from this country pride of place in organic chemical manufacture. Relative efficiency of patent legislation, of technical education, of selling organisation, of technical research were the conditions in which we were, broadly speaking, inferior in the period of which he spoke. They were factors which profoundly affected the manufacture of dyestuffs and synthetic drugs, which were newer industries undergoing rapid development. They did not affect in the same degree the robust inorganic industries which had been established by the great genius of the leaders in our alkali industry.

He was aware that in speaking thus of our shortcomings in technical research, less than justice was done to the work of a few British manufacturers whose efficiency had enabled them always to hold their own in the face of those and other difficulties. Nevertheless, generally speaking, the position was as he had described when, with the advantage of distinctly improving conditions, we set out to rectify it with renewed determination in 1914.

Defective Patent Legislation

During the period of which he had spoken, the Society of Chemical Industry had done much in bringing to public notice the difficulty and discouragement which British industry suffered owing to our defective patent legislation, to the shortcomings of our technical education, and to the need of greater facilities for using duty-free alcohol. In particular he had in mind the work of two of their distinguished past presidents, Thomas Tyrer and Ivan Levinstein, who did more perhaps than any others in effectively calling attention to these matters. To Mr. Levinstein, the well-remembered father of the ex-chairman of the Manchester Section, in particular the whole nation owed a debt of gratitude for what he did in connection with the amendment of patent law. The immense effort which these men made, and the personal sacrifice which they incurred, were incomparably greater than would have been called for if the habit had then been earlier formed of Government departments consulting those with practical experience of the needs of industry in all matters relating to legislation and administration. Throughout its existence the Society of Chemical Industry has exerted a powerful influence on behalf of technical and industrial advancement by helping to mould public opinion. Without its work the position in 1914 would have been much worse than it was. The Society's work led finally to the formation of a body which was now so well organised and managed as to be ever in readiness to advise Government departments on all matters relating to chemical industry. He referred to the Association of British Chemical Manufacturers, of which their late president has occupied the position of general manager with great distinction since 1918.

Mr. Carr then proceeded to review the business combinations which took place in Germany, and pointed out that the efficiency of organic chemical manufactures in Germany was greatly enhanced before the war through the operation of selling cartels and the gradual drawing together of large manufacturing concerns. The first achievement was the elimination of competition as between Germany and the organisation of concerted efforts to undersell foreign competitors in those lines in which there seemed to be a likelihood of dangerous competition arising; owing to our inferior organisation we thus became in a measure the shuttlecock of German men of business.

The Outlook To-day

To-day the organic chemical industry has to meet an even more difficult problem, for whereas fifteen years ago it was but one part of the chemical industry with which we were in competition—that concerned with dyestuffs and medicinal products—we were now faced with a giant organisation concerned not only with the manufacture of dyes and intermediates, but also fortified by great basic industries in fertilisers, artificial silk, and primary products, and probably but a few years hence to be fortified also by large production of fuel oil from coal. Co-operative organisation in Germany had helped their manufacturers and would have to be studied closely. We did not need to follow precisely the same co-operative method—we could not do so advantageously—but we must find a way of giving free scope to individual effort and removing the taint of unfriendliness from trade rivalry which was so liable to arise from unrestricted competition.

Mr. Carr summarised the characteristics of organic chemical manufacture thus:—

(1) Its many branches requiring different salesmanship, as, for instance, dyes and medicinal chemicals, but utilising the same intermediate compounds.

(2) The complexity of manufacturing processes, calling for intensive and minutely detailed study of the best methods and of those conditions of chemical reaction which give the best results as regards yield, cost, the nature of the by-products,

corrosion of the plant, labour, overhead charges, and so forth.

(3) The need for developing specialised plant designed to give the best control and to require the least amount of labour, and that this plant should be kept as continually employed as possible, so that the overhead charges for its maintenance are distributed over a large bulk of production.

(4) The necessity for writing off expenditure on plant in a relatively short space of time in order to be in a position to reconstruct it on improved lines as soon as necessary.

(5) Research so organised that free, unfettered use can be made of the imagination in devising better methods of producing known substances, in originating new products, and in discovering new purposes to which known products can be applied.

These characteristics, he said, demanded organisation in order to maintain and extend their already successful organic chemical industry. They all, and especially the first two of them, make an imperative demand for economy of effort by the prevention of excessive overlapping. This had been proved to be necessary in Germany, where the industry was well developed—how much more necessary must it be for those of our manufactures which were established on a smaller scale, which was true of most of them? The reason why this had proved advantageous in Germany was that the vast bulk of the substances with which we were concerned in organic chemical manufacture were those for which there was a definitely circumscribed market, so that over-production quickly followed if there was much overlapping. The result of this was that plant became idle, overhead charges per unit of production are much greater, and the cost became such that it was impossible to sell in competition with those better organised.

Chemical Engineering

Mr. Carr then dealt with the necessity for a correlation of effort among manufacturers and a detailed study of method in the processes adopted. He pointed out how rarely it happened that finality was reached in the matter of process improvement, and it was a common experience that processes handed over to works under capable management underwent continual improvement for many years, often resulting in substantial reduction of cost. He also referred to the part which chemical engineering played in establishing new processes. Probably the most critical stage in the evolution of a process was that of determining how to obtain the results of the laboratory when working in large quantities. The engineer who had an adequate perception of the niceties of the requirements from the chemists' angle of vision was as rare as the dodo. On the other hand, a chemist with that well developed engineering sense by which alone this gap could be bridged had hitherto been too hard to find in this country, and our greatest need at the present time was for a larger proportion of men with this knowledge and ability. Chemists came up against bitter disappointments because their processes failed to give the predicted results on the large scale. Blame was laid at the door of the engineer, the plant maker, and the process worker; but the fault was with none of these, but arose from the fact that it required a chemist with engineering judgment to conduct this most critical stage of process investigation, and these men were still too rarely found in the team. It was such men who were of the greatest help in co-ordinating the work of the chemist and the engineer.

Just as chemical engineering knowledge was needed in the evolution of the manufacturing process, so also was it an essential qualification on the part of those concerned in planning and devising plant to meet the precise requirements of a process.

In summarising the various points of his address, Mr. Carr said that from the economic point of view the need was self-evident that we should as a nation become in an increasing degree productive, thus enabling us to export more goods made by highly skilled labour in exchange for food produced by the less highly skilled. This was a belief to which all must sooner or later subscribe, and he wished we could see more evidence that the truth of it was recognised by trades union leaders in this country. The increased wages and shorter hours which they strove to attain, by methods which were for the most part wrong, might be gained by better production and the development of skill.

Recent Advances in Catalysis

Dr. E. K. Rideal's Review

SPEAKING at the opening meeting of the session of the London Section of the Society of Chemical Industry on Monday, Dr. E. K. Rideal outlined some of the directions in which progress is being made in regard to catalysis. He showed how the effectiveness of even a good technical catalyst was still surprisingly low and how light was now being shed on the specific effects of promoters. The fact that the surfaces of catalysts were not entirely uniform had been proved by his own work and had been supported by work done by others, and to-day it could be said that there was fairly conclusive evidence that the surface of a catalyst was not uniform in regard to its surface energy. Especially was that so in the case of simple carbon. The catalytic industry had developed owing partly to the fact that by the addition of small traces of certain substances, called promoters, it is possible to increase the catalytic activity of a given weight of material enormously. That had first been exploited by the Badische Co. in the manufacture of hydrogen from water gas. Referring to his own experiments upon promoters, Dr. Rideal showed that taking pure sugar and adding iron to it had the effect of increasing the catalytic activity by 14 times, whilst if, in addition, nitrogen was added, then the surface was 800 times as active as that of the original material by itself. He suggested that further investigation into the properties of promoters would lead to industrial results of considerable value.

Again, in homogeneous catalysis, a study of the inhibition of autoxidation and polymerisation of varnish and paint vehicles, and of anti-knock compounds in gas mixtures opened up a new vista of pure research, the desire, of course, in this case being to slow down oxidation and not, as in the previous case mentioned, to hasten it. In the case of paints and varnishes, this was extremely important in relation to their stability, especially when sent to hot and sunny climates, and the study of the action and properties of inhibitors was peculiarly work which could be done in the universities, it having, although looked upon as pure research, a very strong industrial basis. There were several theories regarding the action of inhibitors, but Dr. Rideal said that recent work in America had suggested that the walls of the vessel in which the reaction took place and the impurities in the materials being used played an important part, and he hoped experimentally to prove or disprove that view.

In the course of further remarks, Dr. Rideal referred to the synthesis of fats, the production of methyl alcohol, and the Bergius process as instances of pure research which had had unexpected commercial applications, and concluded by remarking that the experiments of Professor E. C. Baly and others on the transfer of energy, on collision, from photo-electric or electron excited molecules to ordinary molecules was suggestive of developments in a technical direction.

Acknowledging a vote of thanks, in proposing which Mr. C. S. Garland, the chairman, commented on the great interest now being taken in chemical industry in catalytic methods as compared with the position a short time ago and of the practical possibilities, Dr. Rideal emphasised the need for a greater degree of co-operation between the industry and the universities in order that the real problems of the industry might be investigated from a fundamental point of view by those best able to do so. Incidentally, he also urged the need for greater financial support for this work, so that men could be trained in the universities in a manner that would better fit them for industrial life afterwards.

The Individualist Campaign

THE Individualist campaign will open on October 26 with a luncheon at which Sir Hugh Bell will be the speaker, and Sir Ernest Benn will be in the chair. This will be the first public activity of the new Individualist Bookshop, reference to which has been made in these columns. Applications for tickets to the luncheon are already arriving in such numbers as to ensure not only a distinguished but a large gathering, and the event promises to be of exceptional interest. The Bookshop itself is now open, and business in full swing, at 40, Marsham Street, Westminster—a part of the Empire's political activities—and those interested will now be able to find at one convenient spot a complete collection of the literature of Individualism.

Low Temperature Carbonisation Methods

Some Notes on the Salermo Process

In view of the attention now being given to low-temperature carbonisation systems, the following description of the Salermo process, based on patents taken out by E. M. Salerni, is of interest. The description and claims concerning the process are given as published by the authors of the process, without any expression of opinion on our own part.

THE Salermo process is based on the use of a new type of retort which belongs to the class of externally heated retorts with continuous feed, the material heated undergoing continuous and regular stirring. An integral part of the process is the pre-drying, by means of waste heat, of the material to be carbonised.

The retort consists of semi-cylindrical troughs of mild steel which may be of different sizes, according to requirements. A standard trough for carbonising non-caking coal is 10 feet long with a radius of 8 inches. For bituminous coals, the radius is reduced to 5 inches and the trough shortened. From 8 to 14 of these troughs are placed side by side under a common roof, thus making a single carbonising chamber or retort. Along and above each trough is a central shaft provided with stirring paddles fixed normally to the shaft. These paddles are placed close to each other, but in different planes. They can be made to revolve at any rate required, and their action is threefold: (1) To cause the material in the troughs to move along from trough to trough; (2) To keep it in constant motion so that it behaves like an emulsion or a liquid; (3) To keep clean the inside metallic surfaces and so secure an efficient heat exchange. Each paddle terminates in a scraper whose function is to remove from the bottom and sides of the troughs any graphite, etc., which might tend to form. The scrapers are readily replaced when wear and tear make renewal necessary. The first trough is fed automatically and continuously from the pre-drying installation placed above the retorts.

The material used must be of certain dimensions, and it has been found that to secure an even flow, the best size of particles is from ⅜ inch downwards.

Pre-Drying

The material reduced to a suitable size is taken to a hopper by an elevator and fed on to a drying conveyor to a thickness of about one inch. The conveying system consists of two chains running alongside two superposed parallel fixed plates, the chains being connected transversally by metal rods at fixed intervals. The material passes at any desired rate along the first plate and returns on the second and lower plate. The conveyor is active on both journeys. The material is fed continuously down a seal into the first trough of the series. The nature of the seal can only be made clear from a detailed drawing, but it consists of an arrangement of partition plates, the coal itself being the luting material. It is quite efficient and prevents any escape of vapours or gases from the retort. The drying is done by the hot combustion gases which have done their work in heating the retort and their direction of movement is on the principle of counter currents.

The retort is heated by means of hot gases from any outside source, or by burning the gas evolved in the process or by means of solid fuel—coal of a poor quality serving the purpose quite well. The heating chamber is divided from the retort by a series of brick arches, so that no flames play directly on the retort. This minimises the wear and tear and secures an even distribution of the heat. From the heating chamber the gases proceed through a by-pass and along the bottom of the troughs which form what is really a corrugated retort. This is supported at the sides on brickwork. The last trough at the semi-coke exit end is heated by the hottest gases at a temperature of some 700° C. Careful measurements have shown that the coal itself, which is in motion all the time, and not left in contact with the hot metal, is at a temperature of not more than 500° C–550° C. The temperature in the gas, taken just above the heated material, is round about 450° C., and is the highest temperature to which the products are exposed. The hot gases enter the drier at a temperature of 300°–400° C., and go out at 80° C. The last trough is provided with a seal of the type already described as being between the drier and the first trough of the retort. The products of distillation are in no ways diluted by the heating gases.

The distillation products are filtered hot before any condensation takes place. The vapours pass through two dust-extractors of a new and simple type, easily cleaned one at a time without interruption of the process.

Condensation of Volatile Products

From the dust-extractors the hot gases and vapours pass through impact water-cooled condensers of a special design, involving two stages, where the primary tar is condensed. To facilitate condensation and to economise water, the condensers are usually placed on top of a vertical tube of wide section, containing a few baffle plates. This tube serves as a pre-condenser and for the eduction of the tar, the lighter portions excepted. The condensers are connected with a special arrangement for decantation of the warm tar. The rich gas left is scrubbed and stripped and finally passes to a gas holder.

The carbonised material is discharged continuously from the last trough on to a cooling chain conveyor of the same type as the drier already mentioned. In this case there is fitted a system of cold-water pipes between two fixed plates, and when the semi coke is discharged from the conveyor, it is perfectly dry and nearly pulverised, and at any temperature from 500° C. downwards as may be arranged for. If the cooling be omitted the hot material can be used for the direct feeding of steam

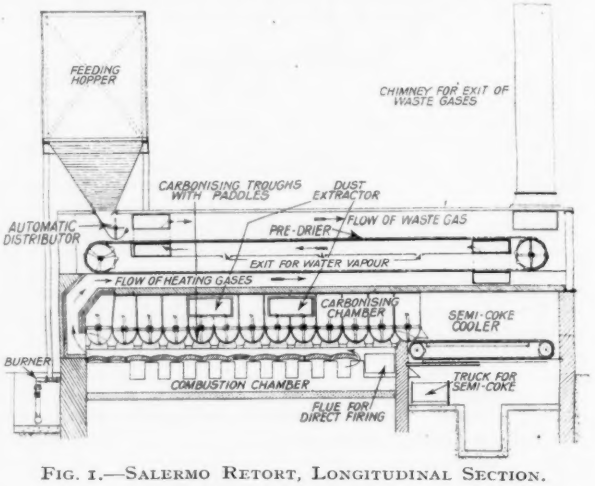

FIG. 1.—SALERMO RETORT, LONGITUDINAL SECTION.

boilers, thus effecting a great economy in view of the dryness and temperature of the fuel.

Advantages of the Process

The plant itself, it is claimed, is simple in construction, and very compact. All the essential parts are in metal and there is but little brickwork required. The parts are easily renewed, and the whole is readily accessible for cleaning. The plant may be taken down without difficulty, moved and re-erected if necessary. The original cost and the upkeep are both low in comparison with other processes. The plant is extremely flexible, as it is possible to vary the rate of charging, of drying, of heating, and of carbonising. The size of the troughs can be varied to suit particular materials, and once fixed, the depth may be increased by the addition of a cap fixed lengthwise along the common edge of two contiguous troughs. The plant can be designed without variation of principles to deal with material as various as lignite, oil shales, non-coking and bituminous coals, all varying in their moisture, plasticity, and volatile contents. The weight of the plant in total is some 8 cwt. in metal and 8 cwt. in brickwork, etc., per ton treated per day, for a plant capable of a minimum output of 75 tons per day. Control is easy and requires a small personnel. The plant can be worked continuously for weeks at a time, and after a long period all necessary cleaning and renewals can be done in 48 hours.

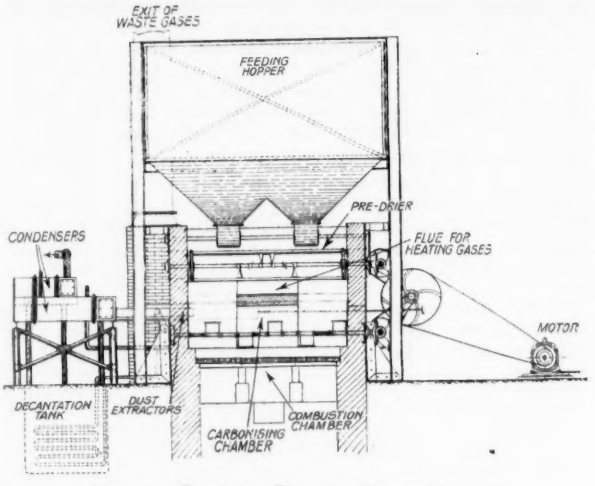

FIG. 2.—SALERMO RETORT, CROSS SECTION.

Products and Yields

(1) A high yield of true primary tar, which is claimed to be better than the tar obtained in any other process, by virtue of very low dust content, low water content, low density and low pitch content. The last two show the absence of secondary reactions due to excessive heat.

(2) A gas of high calorific value, from which appreciable quantities of spirit can be obtained by scrubbing.

(3) A semi-coke which is quite dry and homogeneous. This material is non-vitrified and porous, and still contains from 10 per cent. to 15 per cent. of volatile matter but no tar, so that it burns readily and without smoke.

The following are average and conservative yields, based on tests carried out on a number of Scotch and Yorkshire coals :—

Primary tar: 20–22 gallons per ton at 16,250 B.Th.U.'s per lb.

Gas: 3,500–4,000 cubic ft. at 870 B.Th.U.'s gross and 785 B.Th.U.'s net per cubic ft.

Semi-coke : 75 per cent. of the weight of the coal.

Equally satisfactory yields have been obtained from the treatment of lignites and oil shales.

From shales is derived a primary tar generally free from acid constituents from which may be obtained motor fuel and also lubricating oils.

Possible Uses for Products

Gas.—Where the material treated yields a rich gas of high calorific value, the gas can be stripped for the removal of light fuel oils which can be used as motor spirit, the remaining gas being used for heating purposes. The gas may also be used for the enrichment of town gas to raise its calorific value, the provision of separate power gas, in metallurgical operations, for glass works, for chemical industries generally.

Primary Tar.—This may be used as fuel, but this would be a crude use of material. There is evidence, however, that even for this purpose it is more valuable than ordinary coal tar, the price obtained for it in Germany being more than twice as much. In the Sarre district, the primary tar is in part used for the impregnation of wood, and because of its high cresylic acid content it fetches a considerably higher price than coal tar. The Salermo process subjects this primary tar to a catalytic treatment, according to the Mony patents, and, after the removal of phenolic bodies, it yields a high proportion of low boiling liquid fuels which can be readily separated into 6 to 8 fractions for use as motor spirit, as solvents, or for blending with other fuels. Experiments have shown that a yield of some 80 per cent. on the dehydrated tar may be obtained of liquid fuel, the whole of which distils between 60° C. and 150° C. The only residue is a retort carbon of excellent quality.

Semi-Coke.—The semi-coke as obtained from non-coking coals is in too small a form for domestic use without further treatment. Its main uses are for the direct firing of steam boilers. A Salermo unit may be erected in close proximity to a boiler which can be fed directly with the hot semi-coke as produced. The great advantage of using dry fuel is shown by the fact that preliminary tests indicate that 15 cwt. of this semi-coke give effective results of the same order as the one ton of coal from which it is derived. It has been moulded into ovoids by the help of a binder, with good results in grates and stoves. In the process of getting semi-coke from bituminous coal the smaller pieces tend to agglomerate, and the final product consists of at least 50 per cent. of material directly usable in open grates. The gas and tar are obtained as valuable by-products. The semi-coke is easily converted into a finely pulverised fuel, the use of which is daily growing in importance. As compared with the ordinary methods of pulverising coal which requires to be dried and specially crushed, the Salermo process yields a perfectly dry material which, weight for weight, is more effective than pulverised coal.

At the Sarre mines the process has been working for nearly a year, and has been the subject of reports by M. J. Sainte-Claire Deville.* The two units erected deal daily with 25 tons of coal which is very wet and of low density. A further installation to deal with 200–250 tons a day has been ordered. The object of the treatment in this case is to produce from poor coal a semi-coke of a definite volatile matter content to blend with a flaming coal which is not satisfactory for making the best grade of metallurgical coke. The results are said to have been very satisfactory.

Other installations going up, or proposed, are :—

	Tons per day.	Material carbonised.
Yugoslavia	300	Lignite.
Flanders	60	Coal for pulverised fuel. This plant is being erected to work in conjunction with Babcock and Wilcox boilers.
Spain	75 / 4,000	Lignite.
France		Shale and coal schists.

Some of the Claims

The Salermo process claims to be a definite advance on existing processes of low-temperature carbonisation. It is based on a detailed study of thermal efficiencies and embodies a number of new ideas in design. The units which are small, easily and cheaply erected, worked and maintained, have a high throughput, are continuous in working, and give high yields and quality of the products obtained. Carbonisation is rapid and, owing to the construction, repairs are speedy, so that the actual running days per annum reach a high figure not previously obtained. The actual erection of a plant capable of treating 200 tons of coal per 24 hours can be effected in one month. The process is flexible and adaptable to widely varying materials, from poor coals and lignites, to oil shales and bituminous coals. This process should make it possible to work profitably the large accumulation of inferior coal now lying at the mines in this country. It may be found an auxiliary of great value in ordinary gasworks. Finally, the primary tar obtained, about which so little is known at present, by whatever process obtained, is likely to prove a material of first importance in connection with the very desirable production of liquid fuels in this country.

Salermo, Ltd., has been formed as a private pioneer company to exploit in Great Britain and the Colonies the Salerni and Mony processes and patents for the low temperature carbonisation of coal, lignite, shale, etc., producing, in the case of coal, smokeless fuel, rich gas, and a valuable primary tar, and the conversion of the latter into liquids fuels, solvents and lubricants. Experts from this country who have inspected the first installations on the Continent are of opinion that the processes are sound, simple, economical and offer bright prospects for a solution of this all-important problem. The object of the company is to demonstrate by commercial units under all conditions and with all classes of material suitable for carbonisation, existing in this country, the possibilities of the patents. The personnel of the company are all primarily interested from a national point of view, but it is recognised that the financial possibilities are great and must be so for a successful solution. If results come up to expectations, a system of low temperature carbonisation and production of liquid hydrocarbons will have been secured which, apart from its purely financial side, will solve a national problem of universal concern and urgency.

* *Chimie et Industrie*, Sept. 1925, Vol. 14, and Feb. 1926, Vol. 15.

Indian Chemical Notes

(From Our Indian Correspondent.)

The review of agricultural operations in India for the past year gives an interesting account of the research which is being carried out at Pusa and other centres on manures and fertilisers. It has been found at Pusa that the loss of nitrogen as ammonia during the fermentation of urine can be prevented by the addition of sulphur and appropriate oxidising bacteria, the ammonium sulphate formed being readily available as a source of nitrogen. Similar results have been obtained during the preliminary stages of decomposition of bone-meal in the soil and in composts. A successful method of working up apatite has been elaborated. The process involves the solution of the mineral in perchloric acid and the subsequent precipitation of the dissolved phosphoric acid as lime phosphate.

Rubber Cultivation

Rubber is grown mainly in Southern India and Burma, the average area under crop being about 130,000 acres and the average annual production 15½ million lb. In Southern India a highly satisfactory method of budding Hevea rubber under local climatic conditions has been arrived at in which an H cut is made in the stock and the bud inserted by raising the two lips, both being afterwards closed and bound down tightly over the bud. An anti-drip device has also been devised for reducing the loss of crop during the monsoon. Spraying with Bordeaux mixture has proved such a cheap and effective remedy for checking secondary leaf fall that an increasing number of trees are being sprayed every year. With a view to determining whether destructive distillation of rubber has economic possibilities, several tests with scrap rubber were carried out. The results, however, were not favourable. Two diseases of rubber, black thread and abnormal leaf fall, are under investigation in Burma.

New Companies Formed

According to the returns of the Commercial Intelligence Department, seven companies were started in India during 1925-26 for the manufacture of chemicals, with an aggregate capital of Rs.11 lakhs, three companies for the manufacture of leather with an aggregate capital of Rs.3 lakhs, one company for the manufacture of glass with a capital of about 2 lakhs, four companies for the manufacture of soap and candles with a capital of about 6 lakhs, eight match factories with a capital of 33 lakhs, three oil mills with a capital of 13½ lakhs, seven coal companies with a capital of 30 lakhs, one manganese company with a capital of 40 lakhs, one petroleum company with a capital of 45 lakhs, and three rubber-planting companies with a capital of 19 lakhs. In Bombay three film-making factories and one artificial silk manufacturing mill (Courtaulds, Ltd.) were started during the year.

New Uses for Wood

The timber seasoning experiments that are being carried out at Dehra Dun suggest new uses for timbers which hitherto were regarded as of limited utility. It is reported that the Ishapore Rifle Factory, belonging to the Government, will now use Kashmir walnut, specially seasoned at the Dehra Dun Institute, for making rifles. Until now the Kashmir walnut was being used for furniture making only. The new rifles will be specially marked and observed when put into service, and if the experiment proves successful this wood will be used permanently for making rifles at the factory, in place of the wood now imported from America for the purpose.

Oil Fuel in Bombay

It is of interest that Bombay industries are using less coal and more oil fuel and electrical energy for power purposes. In 1913–14 there were 82 cotton mills, all of which without exception used coal as their source of power. In 1924–25, 61 mills used hydro-electricity as their main source of power, 23 used oil fuel, and the rest used coal. The imports of oil fuel now reach 60 million gallons, and it has displaced coal to the extent of about 450,000 tons, to which the imports may be taken as equivalent.

Indian Turpentine Industry

The working of the factory belonging to the Indian Turpentine and Resin Co., Ltd., during the year 1925-26, has, according to the report now published, resulted in a profit of Rs. 127,000. After providing for depreciation, reserve, etc., a dividend of 10 per cent. has been declared. The report states further that a large quantity of the company's output was exported and that the company's products were now firmly established in the foreign markets. It may be stated here that this factory was first worked by Government as a pioneer factory and that when its success was established it was handed over to the present company. The U.P. Government hold half the total number of shares in the company.

Iron Ore in Burma

At a recent meeting of the Engineering Society of Rangoon, Mr. A. C. Martin made an announcement that about seventy miles from Rangoon, Burma has one of the richest deposits of iron ore in the world. Samples were sent by Mr. Martin to America, Great Britain, Germany, and Japan, and also to the local chemists, and their analysis showed good results, the ore having no sulphur whatever in it. There are also other big deposits in Letpadan and on the Ye section. It is said that Japan has offered to take all the iron Burma can produce, as she has no iron deposits of her own. There is also a large deposit of laterite in Burma.

Indigo Dyeing in India

In a short pamphlet which has been published in connection with the exhibition of the ancient Indian textiles recently held in Bombay, Miss Atiya Begum describes how the indigo dyeing process was carried on in ancient times in India. According to her, the dried Indigotier was very finely powdered and mixed with water and well beaten in the sun by a bamboo, split in four at one end, and then a tiny hole was bored at the bottom of the earthenware vat and the water allowed to run out. The deposit was taken out and arranged in small squares on wood placed in the shade. Then "Taveri" seeds were placed in water for 24 hours. This water with the seeds was poured into the prepared indigo and it was left for four nights and days, stirring well three or four times a day, when it was ready for use.

The Black Dye

The ancient process of obtaining black dye is described as follows: Pieces of iron and dross were placed on a fire of dried banana leaves and heated red hot, cooled and placed in a vessel and hot Canji (water in which rice had been boiled) poured over it, when it was exposed to the sun for a whole day. The liquid then was removed and placed in a separate vessel. Then coconut palm vein was taken, poured over the similar iron and dross pieces, and further exposure to the sun for four days permitted. The vein liquor and the Canji liquor were then mixed, and this formed an excellent coal black dye, harmless and lasting.

Indian Drug Manufacture

Lecturing before the Rotary Club, Calcutta, Mr. A. C. Allen demanded the adoption in India of a measure on the lines of the British Foods and Drugs Act in order to protect the public from the indigenous production of medicines. His contention was that most of the drugs and medicines manufactured in India and put on the market do not form the genuine article, as there is no standard imposed by the government in India.

The Madras Trade in 1925-26

Imports of chemicals into Madras in the year 1925–26 amounted to Rs. 26 lakhs as against Rs. 24 lakhs in the previous year. The United Kingdom supplied goods to the extent of 19½ lakhs, and Germany only three lakhs. Imports of drugs and medicines advanced from Rs. 20½ lakhs to Rs. 23½ lakhs. The export of chemicals, consisting mainly of acetate of lime to the United Kingdom and Japan, amounted to about Rs. 4 lakhs. Under drugs and medicines, the exports of nux vomica amounted to Rs. 2 lakhs, while shipments of senna fell off from Rs. 10½ lakhs to Rs. 8½ lakhs on account of damage by the heavy rains. The value of cinchona bark exported amounted to Rs. 2½ lakhs. The export of oils of various kinds during the year from Madras reached the value of about Rs. 33 lakhs. The export of animal oil, chiefly fish oil, declined from 369,000 gallons to 95,000 gallons. Among essential oils, export of lemon grass oil expanded from 57,450 gallons to 66,700 gallons, France taking 29,000 gallons, the United States 12,000, and Germany 6,000. The exports of castor oil amounted to 456,000 gallons, of which the United Kingdom took 72 per cent.

Manchester as a Chemical Centre

A Civic Week Review

In a special number published in connection with the Civic Week celebrations, the *Manchester Guardian* gives an account (reprinted below) of the position of Manchester in the chemical industry :—

Manchester's position in the chemical industry is essentially that of the centre of industrial Lancashire, and Lancashire for the production of chemicals holds the leading position in the country. While its contribution to chemical production is considerable, to attempt a consideration of the city as a producer alone would be to risk giving a very incorrect impression of the part it actually plays. The merchanting, transporting, exporting, and testing of chemicals are all phases of the industry for which Manchester has become a recognised centre. Like many other local industries, the chemical industry probably owes its origin to the needs of the textile industry, which remains to-day its chief customer on account of the enormous amount of chemicals used in such processes as bleaching, dyeing, printing, and finishing.

The first developments of real importance were the introduction of vitriol instead of buttermilk for souring, and the substitution of chemical methods of bleaching for the former "grassing" or sun bleaching, which, in addition to the large areas of ground necessary, required very considerable time. The process, in fact, was reduced immediately from some eight weeks to a few days. About the same time artificial soda was prepared and the Leblanc process was introduced, James Muspratt starting a works at Liverpool about 1823, after which works were erected at Widnes, St. Helens, Runcorn, and elsewhere. Thus was born the alkali industry of the United Kingdom, an important branch of the so-called heavy chemical industries producing sulphuric, hydrochloric, and nitric acids, chlorine, calcium, barium, and magnesium chlorides, ammonium sulphate, caustic soda, Glauber salts, acetic acid, and other chemicals in which Lancashire to-day holds the leading position. The availability of necessary raw material such as coal, limestone, and sulphur, together with excellent transport conditions, played, of course, a very important part in the development.

While the textile industry can thus be said to have given birth to Lancashire's chemical industry it has been by no means the only factor accountable for its present many activities. Engineering, making equally rapid strides during this period, placed increasing demands on chemical skill, providing at the same time better facilities for the manufacture of the increasing number of its products. Indeed, the history of these three industries, or of any one of them, is a most interesting example of industrial interdependence. There has been no arrest of the progress, and to-day Manchester can be described as the centre of an area in which very few branches of the chemical industry are unrepresented. Particular interest attaches to the organic dyestuffs and fine chemical section of the industry, since before the war German production dominated the field, and Manchester, one of the original producers of coal tar dyes, was responsible for manufactures limited both in range and quantity. The manufacture of dyestuffs and fine chemicals received a great impetus during the war, followed by the formation of the British Dyestuffs Corporation, which, in addition to a very wide range of coal tar and other dyes, manufactures intermediate products and general organic chemicals, such as aniline oil and salt, naphthol, naphthylamine, photographic chemicals, and medicinal chemicals.

Dr. E. F. Armstrong, managing director of the Corporation, recently claimed that now 85 per cent. of the country's needs are available from home sources, and while the difficulties experienced have been many, it is confidently hoped that the industry will continue to hold its own. The Clayton Aniline Co., Ltd., is another firm engaged in this section, producing direct cotton colours and other dyes and intermediates, while the British Alizarine Co., Ltd., manufacture alizarine colours, various vat dyes, and other chemicals. In addition to these there are many manufactures of particular dyestuffs, to say nothing of paints and colours with various industrial applications. In fact, in the limited space available it is impossible to do justice to the wide range of products. The most recent addition to this ever-growing field is the manufacture of artificial silk, for which Courtaulds are represented in Trafford Park and other firms in other parts of the district. This can truly be described as another section of the chemical industry which, still in its infancy, is likely to become an important consumer of chemicals in the future.

But, as we have said, the textile industry is by no means the sole consumer of the products of Manchester's chemical manufactures. The iron and steel industries, the general engineering, paper, glass, and rubber industries all use chemicals directly for their raw materials, and it would be very difficult indeed to find an industry into which indirectly chemicals do not enter. For instance, that section of chemistry known as metallurgical chemistry plays a very vital part in the success of such firms as Metropolitan Vickers Electric Co., Ltd., Sir W. G. Armstrong, Whitworth and Co., Ltd., Broughton Copper Co., Ltd., and Meldrums, Ltd., while many processes such as the production of gas from coal are essentially chemical. Then there are the products of firms such as Hardman and Holden, which include tar distillation products, carbolic acid, cresylic acid, acenaphthene, benzene, creosote, heavy and solvent naphtha, naphthalene, fuel and heavy oils, phenanthrene, pitch, pyridene, and toluene. A number of works have grown up with the industrial development of Trafford Park, where the manufacture of edible and other oils and oil cake, glucose, starch, and many other products is carried out. The list could be extended almost indefinitely, but this very brief account must suffice for the production side of the industry.

The suitability of Manchester as a chemical trading centre is largely the result of the facilities afforded by the excellent railway connections and the Manchester Ship Canal. Thus the products of such firms as Brunner, Mond and Co., Ltd., the Castner Kellner Alkali Co., Ltd., Joseph Crosfield and Sons, Ltd., Wm. Gossage and Sons, Ltd., with works at Northwich, Runcorn, Widnes, Warrington, and St. Helens, can rely on easy transport for the alkali, soap, candles, glycerine, oils, etc., which they manufacture. The chemical section of the Manchester Royal Exchange brings together buyers and sellers of chemicals of every kind, and some idea of Manchester's position is conveyed in the statement which has been made that more trade is done in the city than in all the other centres put together. From this account, brief as it necessarily is, it must be obvious that the chemical industry of Manchester with all its ramifications, intimately connected with almost every other section of the city's innumerable industries, must afford a true reflection of their condition. It is indeed an accepted fact that the Manchester chemical market reports reflect the chemical trade, not of the country alone, but of the whole world.

Of Manchester's contribution to the educational side of the chemical industry much could be written. The work of the University and of the College of Technology is too well known to need any elaboration, while the local section of the Society of Chemical Industry, with the facilities it offers for the interchange of ideas, has earned the reputation of being one of the most active and progressive in the country. There are also local sections of the Institute of Chemistry, the Society of Dyers and Colourists, the British Association of Chemists, and the Oil and Colour Chemists Association.

"Necol" Leather Finishes

As usual, Nobel Chemical Finishes, Ltd., Stowmarket, Suffolk (formerly known as Necol Industrial Collodions, Ltd.), exhibited their "Necol" finishes for the leather and allied trades at the Shoe and Leather Fair at the Agricultural Hall this week. As is well known in the leather trade, the above company have been pioneers in this country in the use of nitrocellulose for doped leather, and, as a result of their research and experience, all types of finishes are available, and the company are at all times both anxious and willing to place their services at the disposal of interested firms. The specimens shown included flesh split and grain leather. Cellulose finishes for leather have the important property of being waterproof and fast to rubbing. There were also on view exhibits illustrating transparent waterproof varnish applied to dyed leather and the use of cracking enamels for producing a two-coloured effect, and patent leather produced by the complete nitrocellulose process.

Reviews

FUELS AND THEIR COMBUSTION. By Robert T. Haslam and Robert P. Russell. New York: McGraw-Hill Book Co. Pp. 810. 37s. 6d.

The authors of this comprehensive work are to be congratulated upon their simple and lucid presentation of the existing state of knowledge in the important field of fuel utilisation. The differences which naturally are to be found between conditions in America and in this country do not altogether detract from the value of the book, but in some respects actually give it an additional interest as a basis for enlightening comparisons.

The ground covered is very wide, even for so substantial a volume; and the manner in which the vast amount of available information has been sorted and condensed into readable form may be regarded as something of an achievement. The subject is introduced in the opening chapters by brief, but sufficient, accounts of the origin, composition, and production of the natural fuels—coal, petroleum, and natural gas—and the probable developments in regard to future supplies. Very complete and useful chapters dealing with combustion reactions and combustion calculations follow. Curiously enough, no mention of Seyler's work is to be found in the chapter on "Coal Classification."

It is pointed out that although scientific coal carbonisation must be regarded as a factor in coal conservation, there are purposes for which it can show no substantial advantage, and where the use of raw coal is likely to persist. An interesting estimate of the total amount of energy derived annually in the United States from fuels and water power shows that anthracite and bituminous coal, despite the increasing use of oil and natural gas, still account for over 70 per cent. of the total. In view of these figures the importance of such well arranged and informative sections as appear under the headings of the "Combustion of Coal in Grates," the "Operation of Hand and Mechanically Fired Furnaces," and the "Use of Powdered Coal," is apparent.

As would be expected, the position in regard to fuel oil and its uses is given ample consideration, but it is remarked that several of the most important petroleum-producing districts of the United States have reached the peak of their production, and have started to decline, while new producing areas of magnitude corresponding to the present ones cannot be hoped for. With increasing petroleum consumption America must thus "look more and more to imported oil, except as advancing prices may make it an economic possibility to obtain petroleum products by a method yet to be developed." What this method is most likely to be the authors do not venture to forecast, but considerations of alternative methods of coal treatment find a place in the book. The underlying principles and practical aspects of carbonisation processes are reviewed at some length, the problems of low temperature carbonisation discussed, and the Bergius process mentioned. But it is somewhat surprising not to find either in the discussion of low temperature carbonisation or in the section devoted to steaming in vertical retorts any reference to the important work carried out in this country by the Fuel Research Board. Attention might also have been drawn to the assay apparatus developed by the Fuel Research Board, which has given yields indicating closely those to be expected from the same coal when carbonised at the same temperatures on a commercial scale.

A bibliography accompanies each chapter, and appendices dealing with the more theoretical aspects of the flow of liquids and gases, the flow of heat and rate of heating conclude a thoroughly practical and extremely useful treatise. To all interested in the scientific utilisation of fuels it should prove of service. X.

ORGANIC SYNTHESIS: AN ANNUAL PUBLICATION OF SATISFACTORY METHODS FOR THE PREPARATION OF ORGANIC CHEMICALS. Editor-in-Chief, Henry Gilman. London: Chapman & Hall, Ltd. Pp. 120. 7s. 6d.

The sixth volume of Organic Synthesis embodies contributions by chemists from America, England, France, Germany, Holland, New Zealand, and Hungary. Directions are given for the preparation of the following substances: Acrolein; benzil (a revision, another method having been given in Volume I); 3-bromo-4-aminotoluene; 2-bromoethanol (ethylene bromohydrin); *m*-bromotoluene; *p*-chlorophenyl isothiocyanate; 3-cyclohexyl-2-bromopropene-1; cyclohexylcarbinol; 3-cyclohexylpropine-1; diacetonamine hydrogen oxalate; α, α-diphenylethylene; ethyl acetoacetate (acetoacetic ester); ethyl acetopyruvate; 2-furancarboxylic acid (pyromucic acid) and 2-furylcarbinol (furfuryl alcohol); α-glyceryl phenyl ether; *n*-heptyl alcohol; *n*-hexyl alcohol; mandelic acid; α-methyl-*d*-glucoside; myristic acid; *d*- and *l*-octanol-2; phenyl isothiocyanate; 4-phenylsemicarbazide; quinizarin; *dl*-tartaric acid; thiophosgene; thymoquinone; trimethylgallic acid; and trimyristin (from nutmegs). In addition, the volume contains corrections to some of the preparations given in earlier volumes, subject and author indexes to all the volumes which have appeared, and a list of later references to all previously published directions. The value of this series of books is too well appreciated to need further stress.

British Industries Fair

To the Editor of THE CHEMICAL AGE.

SIR,—Since the appearance of my appeal to manufacturers to support the forthcoming British Industries Fair, I have received communications from which it would seem that the impression exists that it will only be possible for large manufacturing firms to participate, as it is believed that the prices charged for stands are beyond the reach of the smaller firms. Will you kindly allow me sufficient space to point out that this impression is entirely erroneous? The table of charges for stands has been purposely determined to enable the Fair to be advantageous to all manufacturers, large and small alike, and compared with those of many exhibitions the charges are remarkably low.

By exhibiting at the Fair, not only will the smaller firms be making a most valuable contribution to the prosperity of their country, but they will at the same time be seizing an opportunity of increasing their own business at a cost which need not exceed £20 for a stand. They will, in addition to other advantages, have that of the advertising and publicity organisation of the Department of Overseas Trade; their names will appear in the catalogues which will be distributed all over the world; and invitations to attend the Fair will be sent out by the Department to addresses they forward to it.

I am sure that I am not guilty of exaggeration when I say that the British Industries Fair affords an opportunity which no manufacturers, whether in a large or small way of business, should miss, and I confidently urge all to participate in it.—Yours, etc.,

House of Commons, October 5. ROBERT GOWER.

Chemists' Salaries

To the Editor of THE CHEMICAL AGE.

SIR,—The attention of the Association has been drawn to the correspondence in your columns relating to the salaries of chemists. The Association has consistently deprecated the acceptance by qualified chemists of inadequate salaries and has obtained for its members, if not a completely satisfactory, at least a reasonable standard of payment, but at the same time the Association's policy has been and will remain one that shall concentrate first of all upon the problems of organisation and registration as the only means to the economic end.

So long as this question remains unsettled isolated protests, though useful and needful, will accomplish very little. The Association has already done much to prepare the way for more perfect organisation, and it appeals for further support so that its aims and objects, now very well known, may speedily be advanced.—Yours, etc.,

GENERAL SECRETARY, B.A.C.

"Empire House," 175, Piccadilly, W.1.

Magnetic Properties of Molecules

PROFESSOR C. V. RAMAN, the eminent physicist, and those associated with him in the research which he is carrying on in Calcutta, have demonstrated by optical methods that when liquids are placed in magnetic fields the molecules tend to orientate themselves in special directions with regard to the field. The molecules show different magnetic properties in their different parts. These properties can be measured and brought into relation with the chemical structure of various parts of the molecules.

Base Exchange Water Softening

A New Product

In connection with the base exchange or zeolite process of water softening some interest attaches to the new base exchange compound " Basex " just introduced by the Paterson Engineering Co., Ltd., and shown in public for the first time at the Smoke Abatement Exhibition in Birmingham. "Basex" is stated to be the result of a number of years' research and large scale experimental running, and belongs to the class of natural minerals as opposed to the artificial sodium aluminium silicates. Considerable difference of opinion exists as to these two types of base exchange material, but " Basex " is claimed to possess in a marked degree the advantages of a natural material. These include, after suitable treatment and grading, stability, mechanical strength, and no solubility, so that the bed in the softening plant does not gradually diminish in amount, and at the same time add silica and other constituents to the softened water passing through. This is a highly important point in practice, and even with a moderate-sized plant, say 1,000 gallons an hour always flowing through a bed several feet thick, the solvent action of the water is apt to be very marked. " Basex " is guaranteed to be entirely impervious to CO_2 and to be very resistant to all acids. Finally, the degree of chemical reactivity is stated to be high, with consequent rapid regeneration by the salt solution, not exceeding twenty minutes after an eight hour run on the average.

For boiler feed purposes the base exchange method of softening, because of various practical difficulties, is perhaps not quite so efficient a principle as might be imagined, although the case is different for example in laundry work, wool scouring and similar operations in which economy in soap is the main consideration and the presence of sodium carbonate and added soluble salts in the water is no detriment. For steam boilers, however, the matter is different because of priming, while as regards drinking water with much temporary hardness the sodium carbonate in the softened water is detrimental. Because of these various inherent disadvantages of the zeolite method as usually practised, the Paterson Co. have endeavoured to produce a base exchange material of improved quality as regards stability and chemical reactivity, while, as already indicated, retaining all the obvious advantages of the method in general as compared with the lime and soda ash principle. For boiler feed and general technical work, especially with exhaust steam available, as in many chemical works, an ideal combination is often lime and soda ash softening, with oil elimination and heating by the exhaust steam followed by a base exchange treatment to remove the last 5° of hardness. Under such circumstances all dissolved gases are got rid of, the water is zero hardness, and the soluble salts in the water are reduced to a minimum. This promises to be one of the most important applications of " Basex."

Canada's Natural Resources

An illuminating record of the developments in the natural resources of North-eastern Canada, which are resulting in the transference of the newsprint industry of North America to Canadian soil, is contained in a brochure just issued in England by the Canadian National Railways. One of the most interesting features of the production is the number of detailed maps of territories not long opened up and the names of which are unknown to the majority of English readers, for although the Red Lake gold rush took place only a few months ago a map of the Red Lake district is included which indicates the principal developments, the type of country to be travelled, the waterfalls and the horse power which they are capable of developing, the winter and summer routes to the gold fields and the agricultural and timber limits. Most people think of Canada in terms of the " Empire's granary," but few realise that gold at the rate of £500,000 per month is being produced in Northern Ontario, and that Canada, ranking third in the gold-producing countries of the world, will soon rank second. Only a few days ago Arvida, the new town which is springing up on the Saguenay River in Quebec, received a consignment of 3,740,000 ft. of timber for the building of houses, which are to accommodate 10,000 inhabitants within three years. The chief minerals and their location are shown on the maps, and there are interesting charts, such as that relating to nickel production, illustrating the industries of the Dominion.

Explosive Oil Shale Dust

Tests conducted at the Pittsburgh, Pa., experiment station of the U.S.A. Bureau of Mines, have demonstrated that oil shale dusts are explosive, and that their explosiveness increases with their combustible content. The formation of dust during the mining and handling of oil shale is almost unavoidable, and the Bureau considers that the same precautions against dust explosions should be taken in the industries producing or working with oil shale as are taken in safely operated coal mines. Few of the problems of mining oil shale have as yet been encountered and solved in the United States, because no commercial production of shale oil has been attempted. Mining methods will depend largely on local conditions and on the physical characteristics of the deposits, but it is probable that underground methods similar to those used in coal mining will be used.

The dust produced in Scottish shale-mining operations, according to some investigators, is non-inflammable and non-explosive. However, this must not be taken to indicate that oil shale of similar characteristics will be encountered in American shale mines. The results of the tests made by the Bureau of Mines show that oil-shale dust may present a source of danger in American mines, particularly when comparatively rich material is being worked.

Oil shale contains compounds of carbon and hydrogen that are either of a petroleum nature and are strongly adsorbed upon the incombustible part of the shale, or else are present in the shale as a compound (" kerogen ") which has the property of changing into petroleum-like products when acted upon by heat. The oil shales may contain varying amounts of the organic matter, ranging from a trace to more than 66 per cent., depending upon their richness; therefore, it is important to know whether the dusts formed in mining and handling these oil shales are explosive when mixed with air, and if so to indicate remedial measures. Explosibility tests of several pulverised oil shales, selected as being typical of those which in the future may be used in commercial shale-oil production were made by the Bureau of Mines at Pittsburgh. Details of the tests are given in Serial 2758, " Explosibility of oil-shale dust," by Vernon C. Allison and Arthur D. Bauer, copies of which may be obtained from the Bureau of Mines, Department of Commerce, Washington, D.C.

Pneumatic Coal Cleaning Process

The Birtley Iron Co., of Durham, have been experimenting for more than two years with a pneumatic separator, by means of which it is possible to separate the heavy high ash refuse from the raw coal. For some time past, in this connection, colliery managers have been searching for an improvement over the washing process, which leaves so large a percentage of moisture in the cleaned coal. The separator is operated very largely on the lines of those used in America with great success, but it has been modelled by the Birtley Iron Co. to meet the peculiar requirements of collieries in this country. The Birtley pneumatic separator operates on any mass of coal from 4 in. down to dust, yielding a dry product with an efficiency at least equal to that of any wet-washing process. The success of the machine has been thoroughly established as the result of actual working tests which have been carried out, and the Birtley Iron Co. has received an order to install one of these separators at the Government Fuel Research station at Greenwich. They have just completed the installation of a similar machine at the Birmingham Universities Research Station. Briefly described, the pneumatic separator consists of an inclined perforated " deck " or sheet through which an upward current of air is blown; at the same time the " deck " is subjected to a to-and-fro motion with a slight upward cast towards the forward end of the stroke. Two plants of this design have been installed at collieries in this country, one at the Wardley Colliery of John Bowes and Partners, Ltd., and the other at the Heworth Colliery. The former has a capacity of 1,000 tons per day of eight hours, and is the second largest pneumatic separation plant in the world, the largest being at The Comas, West Virginia. A recent test carried out at Birtley with raw Staffordshire coal of from 1 in. to $\frac{1}{16}$ in. in size was found to have 19·95 per cent. of ash in it, whilst the average ash content of the same coal after cleaning on the separator was found to be only 2·7 per cent.

Sulphate of Ammonia Contract

Claim in Respect of Shortage

In the Mayor's and City of London Court, before the Common Serjeant, Sir H. F. Dickens, K.C., on Thursday, September 30, the case of Busch *v.* Alsace-Lorraine and General Products Co., Ltd., was heard. The plaintiff, W. F. Busch, 48, Sachsenstrasse, Hamburg, had brought an action in the High Court against the defendant company, of Pinners Hall, Old Broad Street, E.C., for the amount of £33 4s. 8d. due upon a cheque.

Mr. Willink, counsel for the defendants, said that the plaintiff had obtained judgment in the High Court, and he now appeared in support of a counter-claim raised by the defendants which had been remitted to that Court for trial. Their case upon the counter-claim was that they entered into a contract dated April 24, 1925, whereby they purchased 200 tons of sulphate of ammonia from the plaintiffs, and the counter-claim was in respect of short delivery. The defendants purchased 200 tons of sulphate of ammonia of good commercial quality, 20/21 per cent., in sound strong single bags containing 100 kilos, at £13 4s. per 1,016 kilos, c.i.f. St. Carlos de la Rapita (Spain), in one shipment of 200 tons, net cash against shipping documents. The defendants paid against the documents, not, however, for 200 tons, but for 200,000 kilos. The documents were taken up and passed to a sub-purchaser in Spain. Upon arrival in Spain it was found that the shipment was 6,970 kilos short delivered, there being 193,030 kilos instead of 200,000. The usual shortage from shrinkage of sulphate of ammonia was put at ½ per cent. On that basis, therefore, the defendants were prepared to allow for a shortage of 1,843 kilos, and had claimed the excess of shortage beyond the ½ per cent. normal shrinkage. That was for 5 cwt. 3 qrs. 20 lb. at the contract price of £13 4s. —£66 12s., the amount of the counter-claim.

Mr. Stanley J. Miley, sales manager of the chemical department of the defendant company, said he had held the position since 1925, and had 30 years' experience in the chemical trade. He gave evidence of the contract having been made by the defendant company with the plaintiff, from whom confirmation was received for the sale and purchase of 200 tons of sulphate of ammonia. In due course the shipping documents came forward, and the defendants paid for them. They paid for 200 metric tons. The usual average shortage on a shipment from Germany to Spain or Portugal for 12 months was ½ per cent. to ¾ per cent. In the present case there was a shortage of 3½ per cent. of the value of £66 12s. The reason for the shortage was defective packing, the effect being that the bags were not in a suitable condition for shipment.

There was no appearance on behalf of the plaintiff, and judgment was given for the defendants on their counter-claim for £66 12s., with costs.

New Drug for Malaria Treatment

It is reported that chemists working at the Elberfeld Dyeworks, Germany, have succeeded in synthesising a substance known as "Plasmochin," which is proving very useful in the treatment of malaria. Quinine has, of course, long been useful for this purpose, but the new substance is said to give better results, especially in the case of tropical malaria, which has hitherto shown itself very resistant to treatment. The combined action of "Plasmochin" and quinine also gives good results. The announcement of this important discovery was made at a congress held in Dusseldorf.

"The Analyst" Decennial Index

We have received from the publishers, W. Heffer and Sons, Ltd., of Cambridge, a copy of the Decennial Index of *The Analyst*, the journal of the Society of Public Analysts and other Analytical Chemists. This index, compiled by Mr. M. B. Elliott, M.B.E., covers the years 1916–1925 inclusive (Volumes XLI–L). It forms an imposing volume of 353 pages, well produced and printed, and containing indexes of both authors and subjects. It is an excellent piece of work. The price is 21s. (cloth 25s.).

Sir John Cass Institute

Opening of Winter Session

The 25th session of the work of the Sir John Cass Technical Institute was inaugurated on Monday, on which occasion an address was delivered by Alderman Sir Charles Wakefield, to whom students, who had gained special successes during the previous session, were presented.

Before calling upon Sir Charles to deliver the inaugural address the chairman of the Governors (the Rev. J. F. Marr) referred to the resignation of Dr. Keane who had been Principal for almost a quarter of a century, the appointment of Mr. Geo. Patchin, A.R.S.M., M.I.M.M., as his successor, the generous support given to the work by the important companies connected with the fermentation and petroleum industries, and the gratifying record of university successes. In the latter connection, attention was drawn to the fact that the degree of D.Sc. had been conferred on one of the students as a result of a thesis based on research work carried out in the Department of Chemistry. Particular mention was also made of the further facilities for study which are being provided during the session, including a more advanced course of lectures in colloids, a series of lectures on the retail management of beverages and refreshments, and an advanced course of lectures on petroleum technology, the latter embracing special lectures on petroleum colloids.

During his address Sir Charles said he thought that during the last few decades the social factors that disincline young men and women to serious study had more than kept pace with the development of educational facilities. Cultural impulses had to contend with innumerable opportunities for pleasurable time-wasting, and without doubt millions of foot-pounds of intellectual energy have been expended on cross-word puzzles and competitions evolved by ingenious pressmen. In any age the student had to be made of stern stuff, but in view of the innumerable distractions that tempted to pleasure-seeking the student of to-day must be something of a hero possessed of an exceptional degree of wisdom, strength of mind, and self-control. Success, according to Sir Charles, lay not in the grasping of all that was desirable in material wealth, but rather in complete development of all the finest elements of the individual character. This definition did not bar a reasonable degree of material success, and happily, real creative success in business generally meant the enlargement of wealth and opportunity for thousands of other men and women. Reference was made to the influence of Emerson's writings on the speaker, who concluded his admirable address with the statement that the happiest and most blessed kind of success was not to know that one was successful; not to strive, but simply to be one's self.

Industrial Chemistry Congress

During the course of the sixth International Congress of Industrial Chemistry, held in Brussels from September 26 to October 3, the Congress, at a plenary sitting, passed the following resolutions:—

That it is desirable: (1) That industrialists should signify to the International Bureau of Physico-Chemical Standards the new problems which urgently need solution, and should contribute to their material success by multiplying the subsidies granted to it by certain enterprises or societies; (2) that a census of chemists should be carried out in the various countries; (3) to re-establish legally the authorisation of the employment of glucose in sweets, the value of this sugar being fully demonstrated; (4) that public and private administrations should keep their specifications up to the level of the progress effected in the study of paints and varnishes.

Technical Books

A catalogue and price list of secondhand and new books on technical subjects and applied science, dated September, 1926, has been issued by W. and G. Foyle, Ltd., of 119–125, Charing Cross Road, London, W.C.2. Of interest to chemists are the books under the headings: inorganic and organic chemistry; analytical and practical chemistry; physical and theoretical chemistry; technological and industrial chemistry; physiological and pharmaceutical chemistry; engineering chemistry; and miscellaneous chemistry.

From Week to Week

SIR JOHN BRUNNER arrived at Plymouth from New York on Monday.

RECENT WILLS INCLUDE: Mr. Charles Heape, a director of the Calico Printers' Association, Ltd. (net personalty £93,559), £100,558.

DR. J. F. TOCHER, F.I.C., University of Aberdeen, delivered the inaugural sessional address of the Pharmaceutical Society of Great Britain on Wednesday.

AN EXHIBITION for the trade and commerce of the north-east coast, organised on the lines of a previous one of 1887, is proposed to be held on the Newcastle Town Moor in 1928.

THE LATE MR. C. P. MARKHAM'S residence, Ringwood Hall, near Chesterfield, has been presented by Mrs. Markham to the directors of the Staveley Coal and Iron Co., Ltd., for use as a club for the chief employees of the company.

DR. S. C. LIND, associate director of the U.S.A. Fixed Nitrogen Research Laboratory, and formerly chief chemist to the U.S.A. Bureau of Mines, has accepted an invitation to become director of the School of Chemistry in the University of Minnesota.

JAMES GORDON AND CO., LTD., Windsor House, Kingsway, London, W.C.2, combustion engineers, have received an order from a prominent industrial company for 46 Duplex Mono Combustion Recorders. This instrument records both CO_2 and CO on one chart.

DR. R. B. MOORE, formerly director of the U.S.A. Bureau of Mines and a well-known authority on helium, has resigned his position as general manager of the Dorr Co. to become Dean of Science and head of the Department of Chemistry in Perdue University.

DR. W. E. GARNER will give a lecture on liquid air, on November 12, on behalf of the King Edward Hospital Fund for London. The lecture is one of a series arranged for the same purpose. Details may be obtained from the Secretary of the Fund, 7, Walbrook, London, E.C.4.

AT THE ELECTION of the new directorate of the Nitrate Producers' Association in Valparaiso last week, Mr. W. O. Simon was appointed president in place of Mr. Jones, who recently resigned, and Mr. T. T. Aikman and Mr. Walter Jones were appointed members of the Chilean Nitrate Committee in London.

THE JOURNAL OF THE OIL and Colour Chemists' Association for August contains a supplement consisting of a reprint of the section of the "Reports of the Progress of Applied Chemistry, 1925," dealing with "Paints, Pigments, Varnishes and Resins." This section was compiled by members of the Association.

THE GERMAN WHITE LEAD UNION (Deutsche Bleiweissverband) has broken up. A large number of white lead factories have amalgamated to form the Union of German White Lead Works (Vereinigung deutscher Bleiweiss Werke, or V.D.B.W.), with headquarters at Cologne-Mülheim. Four selling centres will control sales in all German and certain other markets.

A BEET SUGAR FACTORY is to be erected in Shropshire, between Shrewsbury and Wellington. The factory will cost £260,000, and will be erected by the Hygienic Sugar Co. in time to deal with next year's crop if guarantees of 8,000 acres of beet can be obtained. A recent meeting of landowners and farmers at Shrewsbury unanimously passed a resolution in favour of the scheme.

THE GRINDING AND PULVERISING OFFICES of International Combustion, Ltd., 11, Southampton Row, report the following orders:—For England, one 2-roller Raymond mill for grinding barium peroxide and one No. 00 Raymond pulveriser for pulverising chocolate. For Spain—one 3-roller Raymond mill for grinding gafsa phosphate. For France—one No. 0000 Raymond pulveriser for grinding anhydrous sulphate of soda and one No. 00 Raymond pulveriser for grinding arseniate of limestone.

SIR WILLIAM GLYN-JONES returned to Liverpool from Canada on the Canadian Pacific liner *Montcalm* on Saturday. He went out to the Dominion in April last for the purpose of organising the Canadian Proprietary Articles Trade Association, an organisation on similar lines to that which he founded thirty years ago in this country. His efforts in Canada, he stated, have been completely successful. Practically all the wholesale chemists and about 200 manufacturing chemists, representing every part of Canada, have supported the association.

A CIRCULAR LETTER been has issued to all members of the Institution of Chemical Engineers, intimating that an official invitation has been received for a party to travel to the United States of America for a joint meeting with the American Institute of Chemical Engineers. The invitation was first intended for the months August and September of next year, but as 1927 may not be the most convenient time for members, if they so desire the date of the visit can be changed to the same time in 1928. The Council has cordially accepted the invitation, and is awaiting an expression of opinion from members regarding the more suitable date.

MR. DAVID FLATHERS was installed in Sheffield on Tuesday as Master of the Ancient Cutlers' Company of Hallamshire.

MR. J. PARRISH, B.Sc., A.I.C., has been appointed honorary assistant editor of the *Journal of the Oil and Colour Chemists' Association*.

AN INTERNATIONAL GLUE COMBINE, involving an agreement between fifteen different European countries, has been formed as the result of a meeting held in Lucerne.

MR. H. W. GEPP, Chairman of the Australian Development and Migration Commission, will be included in the personnel of the Australian delegation to the forthcoming Imperial Conference.

SIR ERNEST RUTHERFORD, President of the Royal Society, was on Wednesday presented with the honorary degree of Doctor of Science (Cambridge) in connection with the celebration of the tercentenary of Francis Bacon.

DURING THE RECENT MEETINGS of the American Chemical Society the honorary degree of doctor of science was conferred by the University of Philadelphia on Principal Sir James Irvine, Prince Ginori Conti, Professor Paul Sabatier, and Professor Ernst Cohen.

WALKER, CROSWELLER AND CO., 54–58, Queen Elizabeth Street, London, have been appointed sole British representatives of Lewis M. Ellison, of Chicago, U.S.A., the manufacturer of the well-known Ellison inclined draft gauges used on boiler and other power plants.

AMMONIUM SULPHATE importations into Japan amounted in 1925 to nearly 202,000 long tons, while home production reached 130,000 tons. The Japan Artificial Nitrogenous Manure Co., Ltd., operating the Casale process, produced nearly 70,000 tons of sulphate.

APPLICATIONS ARE INVITED for the post of Lecturer and Demonstrator in Inorganic and Physical Chemistry in the University of Sydney, New South Wales. £450–£40–£700. The Agent-General for New South Wales, Australia House, Strand, London, W.C. October 30.

THE MOND NICKEL WORKS at Clydach will close down when the present stocks of coal are exhausted, owing to the prohibitive price of foreign fuel. It was stated last week that there was a three-weeks supply in hand. About 1,000 men are affected, and each will receive ten shillings per week, as during the general strike.

HYDROCYANIC ACID GAS has been used to clear rats from the Elder Dempster liner *Zaria*, on which some cases of bubonic plague occurred recently. The method employed is to scatter a finely divided siliceous earth saturated with hydrocyanic acid gas, called zyklon, throughout the affected area, which is then sealed up.

PEMBREY MUNITION WORKS, near Llanelly, comprising 771 acres of freehold land, together with plant, machinery, and buildings, were sold by public auction at Swansea, on behalf of the Liquidation Department of His Majesty's Treasury, on Tuesday, the entire lot being purchased by Edgar J. Rees, Ltd., iron merchants, Llanelly, for £30,000.

MR. WILLIAM L. COOPER, of New York, has been appointed U.S. commercial attaché in London to replace Mr. Walter S. Tower, who resigned to enter private business. Mr. Cooper is a native of Saginaw, Michigan, and graduated from the engineering department of Michigan University in 1899. After holding various posts in America he came over to London in 1902 as European Manager to the Robert Blunt Co., of Chicago.

COLONEL SIR EDWARD ALLAN BROTHERTON, BART., had the Freedom of Leeds conferred on him on Wednesday. He said, in reply to the speech of the Lord Mayor, that he had been associated with Leeds for nearly half-a-century. He had never had occasion to regret spending his life there. To ambitious and enterprising young men, he said that there was no part of the country to which they could more advantageously pay attention than the area of which Leeds was the centre.

THE EUROPEAN STEEL CARTEL has finally come into being. On Thursday, September 30, delegates from Germany, France, Belgium and Luxembourg met and concluded the necessary agreement. Production is fixed at 27,528,000 tons annually, which may be increased to 30,600,000 tons. The cartel will continue for five years. The objections of Belgium, which have provided the stumbling-block to earlier efforts to conclude an agreement, were overcome by Belgian manufacturers receiving a quota of 295,000 tons per month, as against the 265,000 tons originally offered.

Obituary

DR. FRANZ GOLDSCHMIDT, for many years editor of the *Zeitschrift der Deutschen Öl- und Fett-Industrie*, aged 47. He was a well-known expert on oils and soaps, and edited volume 3 of the *Handbuch der Chemie und Technologie der Öle und Fette*.

MR. GEORGE JAMES VALENTINE, a research chemist in the employment of the United Steel Company, and a member of the Workington Town Council since 1909, aged 61. He was a nephew of the late Mr. C. J. Valentine, M.P. for old Cockermouth Division.

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The gasometric determination of primary aromatic amines. P. Grigorjew. *Z. anal. Chem.*, Vol. 69, Nos. 1–2, pp. 47–50.

The estimation of antimony by electrolysis from hydrochloric acid solution. A. Schleicher. *Z. anal. Chem.*, Vol. 69, Nos. 1–2, pp. 39–47.

CATALYSIS.—Theories of catalysis. Part III. Inversion of cane sugar by dilute hydrochloric acid. H. V. Euler and A. Olander. *Z. anorg. u. allg. Chem.*, September 16, 1926, pp. 143–152.

CELLULOSE.—Isocellobiose and cellotriose. H. Ost. *Z. angew. Chem.*, September 23, 1926, pp. 1117–1119.

COOLING.—Vacuum cooling. K. Thormann. *Chem. Apparatur.* September 10, 1926, pp. 201–202.

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GLUE.—The water content of glue and its importance for valuation purposes. Part III. F. Baum. *Chem.-Zeit.*, October 2, 1926, pp. 742–744.

HALIDES.—A method for the technical preparation of solid ferric chloride. F. Chemnitius. *Chem.-Zeit.*, September 22, 1926, pp. 701–711.

HYDROGENATION.—Hydrogenation under pressure of salts of aromatic acids. Part II. W. Ipatiew and G. Rasuwajew. *Ber.*, September 15, 1926, pp. 2028–2031.

ORGANO METALLIC COMPOUNDS.—The constitution of mixed organo magnesium compounds. A. P. Terentjew. *Z. anorg. u. allg. Chem.*, September 16, 1926, pp. 73–84.

REACTIONS.—Thermal decomposition of methane on a glowing wire. G. M. Schwab and E. Pietsch. *Z. Elektrochem.*, September, 1926, pp. 430–434.

The reaction between azobenzene hydrochloride and phenol. R. Pummerer and M. Dally. *Ber.*, September 15, 1926, pp. 2175–2181.

A new manner of decomposition of the aliphatic six-carbon-chain. J. v. Braun, W. Leistner and W. Münch. *Ber.*, September 15, 1926, pp. 1950–1958.

SCRUBBING.—On the washing out of carbon dioxide from industrial gases at ordinary pressure. F. Fischer and P. Dilthey. *Brennstoff-Chem.*, September 15, 1926, pp. 277–282.

SILICON.—Relation between the physical and chemical properties of silicon and its position in the periodic system. A. v. Antropoff. *Z. Elektrochem.*, September, 1926, pp. 423–428.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

257,275. Esters of Isoborneol and Borneol, Process for the Manufacture of. Chemische Fabrik auf Actien, vorm. E. Schering, 170-171, Mullerstrasse, Berlin. International Convention date, April 11, 1925.

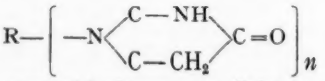
Organic acids such as acetic acid usually require a catalyst such as sulphuric acid in order to react with camphene, but it has now been found that anhydrous formic acid will react with camphene without a catalyst, an excess of formic acid being used. An exceptionally pure product having a high melting point is obtained.

257,766. Active Carbon, Manufacture of. J. Nagtegaal, Coevorden, Holland. Application date, October 14, 1925.

Active carbon is usually produced by dry-distilling carbonaceous material in a retort heated by the combustion of gas from the retort. Superheated steam, air, or other gases are introduced to activate the carbon. In this invention, the burnt gases pass directly into the retort through apertures in the walls, and a pump is provided to facilitate this, the suction side being connected to the interior of the retort, and the discharge side to the combustion space.

257,797. Dyestuffs, Manufacture of. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, December 15, 1925.

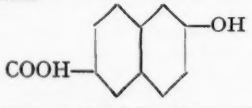
These dyestuffs are obtained by coupling a barbituric acid with an ortho-oxydiazo derivative. The barbituric acids are prepared by condensing the ureas corresponding with the general formula R— (—NH—CO—NH_2)n, in which R represents an aliphatic, aromatic, or aliphatic-aromatic residue, and n the number 1 or 2, with a malonic acid ester. Ureas employed include phenyl urea, ortho- and para-tolyl urea, ethyl urea, benzyl urea, α- and β-naphthyl urea, and others. The barbituric acid corresponds with the general formula—



where R is an atom of hydrogen, an aliphatic, aromatic, or aliphatic-aromatic residue, and n the number 1 or 2. The mordant dyestuffs are red-brown powders dissolving in dilute sodium carbonate solution to a red-brown solution, and dye wool red to brown shades in an acid bath. The dyestuffs may be treated with an oxide, hydroxide, or salt of trivalent chromium and are transformed into acid dyestuffs. A large number of examples are given of the coupling of various ortho-oxyamino derivatives and various barbituric acids.

257,815. 2-Oxynaphthalene-6-Carboxylic Acid, Manufacture of. A. G. Bloxam, London. From I. G. Farbenindustrie, Frankfort-on-Main, Germany. Application date, January 28, 1926.

This acid is produced by the action of carbon dioxide on the potassium salt of β-naphthol at a temperature above 170° C. The dry potassium β-naphtholate is treated in an autoclave with carbon dioxide for 8 hours at 170°-230° C. After cooling, any β-naphthol is removed, and the acids liberated in the usual manner. The 2-oxynaphthalene-6-carboxylic acid is separated from the 2-oxynaphthalene-3-carboxylic acid by means of its greater solubility in hot water. The acid is used as a dyestuff intermediate, and probably has the formula—



257,820. Dyestuffs containing Chromium, Manufacture of. O. Y. Imray, London. From Soc. of Chemical Industry in Basle, Switzerland. Application date, February 4, 1926.

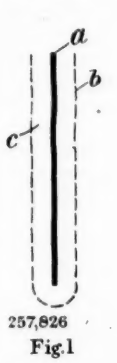
The azo dyestuff from 6-nitro-2-amino-1-phenol-4-sulphonic acid and β-naphthol is treated with a chromium compound such as chromium fluoride, chromium acetate, chromium formate, or neutral chromium hydroxide. The dyestuff gives reddish-black shades on wool.

257,816. Compounds from 1-Phenyl-2 : 3-Dimethyl-4-Dimethyl-Amino-5-Pyrazolone and Halogenated Alcohols or their Esters with Carbamic Acid, Manufacture of. W. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 1, 1926.

Homogeneous compounds are obtained from a halogenated aliphatic monohydric alcohol, or an ester with carbamic acid, and 1-phenyl-2 : 3-dimethyl-4-dimethylamino-5-pyrazolone, equimolecular proportions being used. Examples are given of products obtained by the use of trichlorobutyl alcohol and trichloroethyl-urethane.

257,826. Anodes for Production of Organic Acids. F. Tallada, Calle Consejo de Ciento 334, Barcelona, Spain. Application date, February 18, 1926.

In the electrolysis of salts of organic acids, by-products are obtained at the anode instead of the acid; thus, electrolysis



257,826

Fig. 1

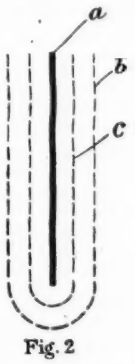


Fig. 2

of acetates yields ethane, oxygen, methyl alcohol, formaldehyde, acetone, etc. In this invention the acids themselves are obtained by the use of a special construction of anode. An insoluble, conducting core *a* is connected to the source of current, and enclosed in a casing *b*, also insoluble and conducting, but spaced from the core *a*, and perforated. The space *c* may be left free, or may contain an insoluble porous substance. An additional outer casing *b* may sometimes be used.

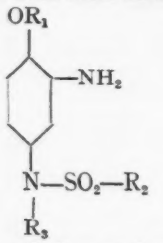
Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention:—240,459 (Farbwerke vorm. Meister, Lucius, und Brüning), relating to soluble vat preparations from quinone vat dyestuffs for wool, see Vol. XIII, p. 581; 247,556 (Soc. of Chemical Industry in Basle), relating to dyestuffs, see Vol. XIV, p. 461; 250,551 (Chemische Fabrik auf Actien, vorm. E. Schering), relating to esters of isoborneol and borneol, see Vol. XIV, p. 578; 255,434 (Chemische Fabrik auf Actien, vorm. E. Schering), relating to colourless products of dialkylbarbituric acids with dimethylamino-phenyldimethyl-pyrazolone, see Vol. XV, p. 307; 255,464 (M. Buchner), relating to hydrofluoric acid, see Vol. XV, p. 307.

International Specifications not yet Accepted

255,900. Dyes and Lakes. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, July 25, 1925. Addition to 231,529. (See The Chemical Age, Vol. XII, p. 590.)

Azo dyes are obtained in substance, on a substratum, or

on the fibre by coupling 2 : 3-oxynaphthoic arylides with the diazo compounds derived from bases having the formula



where R_1 is an alkyl, aralkyl or aryl group, R_2 is an aryl group, and R_3 an alkyl or aralkyl group. Examples are given.

255,904. CATALYTIC AGENTS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, July 27, 1925.

A catalytic material is intimately mixed with a colloidal support, and the mixture washed and dried. Silica, alumina, or iron oxide may be used as supports, and the admixed substance may be an acetate, nitrate, carbonate, or ammonium compound, which are decomposed at raised temperatures. If the support is taken in the sol form, the catalyst may be added without purifying the sol, but if in the gel form, it is preferably purified. In an example, a silica sol obtained by treating sodium silicate with sulphuric acid is treated with copper sulphate solution. The mixture sets to a jelly which is washed, dried at 100° C., saturated with water vapour, washed, and dried at 150°–300° C. The copper oxide can be removed from the product by treating with acids.

255,905. PURIFYING OILS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, July 27, 1925.

Resinous, asphaltic, and other impurities are dissolved out of mineral oils by treating in counter-current with a mixture of methanol and aromatic or hydro-aromatic hydrocarbons of low boiling point.

256,205. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, August 1, 1925.

Monoazo dyes which give yellow shades on acetyl cellulose are made by coupling 1-(2′-chlor)-phenyl-3-methyl-5-pyrazolone with unsulphonated diazo compounds such as diazotised aniline. The dyestuff is ground with sulphite cellulose liquor.

256,225. ALKYL AND ARALKYL RESORCINOLS. H. Hirzel, 5, Winkelwiese, Zurich, Switzerland. (Assignee of W. Schilt, 8, Olgastrasse, Zurich, Switzerland.) International Convention date, July 30, 1925.

These derivatives are of the form $R(CH_2)_3$, $C_6H_3(OH)_2$ in which the hydroxyl groups are in the 2, 4 positions with reference to the side chain, and R may be an aryl or a saturated or unsaturated alkyl or aralkyl radical. A methyl ketone is condensed with an aldehyde, one of which contains a resorcyl group, and the unsaturated ketone so formed is reduced. Thus, 2 : 4-diethoxy-acetophenone is condensed with *n*-butyl-aldehyde in the presence of 10 per cent. caustic soda, the di-ethoxy-butylidene acetophenone being filtered off after neutralisation. This is reduced with hydrogen in acetic acid, using a nickel catalyst. The diethoxy-caprophenone is reduced to di-ethoxyhexyl-benzene by zinc amalgam and hydrochloric acid, or the di-ethoxy-butylidene-acetophenone might be reduced directly in this way. De-ethylation is effected by hydrobromic acid in acetic acid. The hexyl-resorcinol is distilled under reduced pressure and crystallised from benzene and petroleum ether. Croton aldehyde can be used instead of butyl aldehyde.

256,229. SOLVENTS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, August 1, 1925.

Solutions of cellulose esters or ethers, artificial resins, waxes, lacs, perfumes, dyestuffs, fats, oils, etc., are made with the aid of di-ethers of ethylene glycol having the formula R-glycol-R′, in which R represents alkyl, aryl, or aralkyl, and R′ alkyl or aryl radicals. Other solvents may be added, such as esters of aliphatic carboxylic acids, ketones, mono-alkyl ethers of glycols, acetate of glycol mono-methyl ether, aliphatic alcohols, aliphatic or aromatic hydrocarbons, etc. A number of examples are given of the treatment of cellulose derivatives, resins, dyes, etc.

256,243. ORGANO ARSENIC COMPOUNDS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, July 31, 1925.

An *o*-aminoalkylamino- or an *o*-aminoalkyleneamino-benzene-arsinic acid is treated with phosgene to obtain *N*-alkyl- and *N*-alkylene-benziminazolone arsinic acids. The *o*-aminoalkylamino- and *o*-aminoalkyleneamino-benzene-arsinic acids are obtained by treating 3-chlor-4-nitrobenzene-arsinic acid or 4-chloro-3-nitrobenzene-arsinic acid with ethylamine, propylamine, allylamine, or benzylamine, and reducing the nitro group. Examples are given.

256,248. CONDENSATION PRODUCTS OF ALDEHYDES WITH UREA, ETC. Rohm and Haas Co., 40, North Front Street, Philadelphia, U.S.A. (Assignees of F. Lauter, Philadelphia, U.S.A.) International Convention date, July 28, 1925.

The aldehyde is used in solution in an organic solvent such as alcohol, benzene, toluene, acetone, or carbon tetrachloride. Aqueous aldehyde may be used, with the addition of a poly-hydric alcohol or ester. In the latter case, flexible products suitable for photographic films are obtained. Condensing agents may be added. If the product is to be used as a lacquer or varnish, some of the solvent is allowed to remain. Some examples are given.

256,272. DYES AND LAKES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. (Assignees of Farbwerke vorm. Meister, Lucius, and Brüning, Hoechst-on-Main, Germany.) International Convention date, August 1, 1925.

Azo dyes are obtained by coupling a 4-nitro-2-diazobenzene-1-carboxylic ester with an amide, aralkylamide, or arylamide of 2 : 3-oxynaphthoic acid. Thus, diazotised 4-nitro-2-amino-1-benzoic acid methyl ester may be coupled with 2 : 3-oxynaphthoic anilide to obtain a bluish-red pigment dyestuff.

LATEST NOTIFICATIONS.

258,828. Process for obtaining sulphur from alkaline-earth sulphates. Salzwerk Heilbronn Akt.-Ges., Lichtenberger, T., and Flor, K. September 25, 1925.

258,846. Treatment of hydrocarbons. Allgemeine Ges. für Chemische Industrie. September 26, 1925.

258,854. Manufacture and application of new dyestuffs. Soc. of Chemical Industry in Basle. September 24, 1925.

258,874. Cellulose fibres, fabrics, and articles. British Celanese, Ltd. September 22, 1925.

258,887. Method of effecting catalytic reactions. Lazote, Inc. September 24, 1925.

258,894. Manufacture of new azo dyestuffs. I. G. Farbenindustrie Akt.-Ges. September 25, 1925.

258,897. Manufacture of alkali cellulose for use in making artificial silk. Erste Bohmische Kunstseide-Fabrik Akt.-Ges. September 25, 1925.

258,901. Process for manufacturing borneol and isoborneols. Austerweil, Dr. G. September 25, 1925.

258,910. Process for preparing Bz-2¹-hydroxybenzanthrone. I. G. Farbenindustrie Akt.-Ges. September 28, 1925.

Specifications Accepted with Date of Application

234,106. Cast iron, Production of. Meier and Weichelt. May 13, 1924.

236,538. Diacetoxy-mercuri-4-nitro-orthocresol and compounds thereof, Process for producing. Abbott Laboratories. July 2, 1924.

240,492. Wool dyestuffs of the anthraquinone series, Process for the manufacture of. Farbenfabriken vorm. F. Bayer and Co. September 27, 1924.

242,618. Low temperature distillation or drying of fuel by internal heating, Method and apparatus for. Metallbank und Metallurgische Ges. Akt.-Ges. November 4, 1924.

248,724. Depositing copper from solutions, Process of. Orkla Grube Aktiebolag. March 6, 1925.

248,738. Pure hydrochloric acid, Processes for the manufacture of. Verein für Chemische und Metallurgische Produktion. March 9, 1925.

255,474. Hydroxides and carbonates, Process of producing. M. Buchner. June 14, 1924. Addition to 235,588.

258,313. Finely divided metal oxides and silica, Manufacture and production of. J. Y. Johnson. (*Badische Anilin und Soda Fabrik.*) May 15, 1925.
258,340. Synthesis of ammonia, Apparatus for. G. Cicali. June 17, 1925.
258,433. Distillation or cracking of tars, petroleum oils, and similar materials. C. R. Downs. October 7, 1925.
258,436. Distilling oil, Process of. L. E. Hirt. October 12, 1925.
258,462. Camphor from isoborneol, Process for the production of. H. Gammay. January 7, 1926.
258,475. Isoborneol from a mixture of camphene and associated oils, Process for the production of. H. Gammay. February 4, 1926.
258,490. Alloy or composition of matter. J. Walrath. March 15, 1926.

Applications for Patents

Ashcroft, E. A. Treatment of ores, etc. 23,923, 23,924. September 28.
Ashcroft, E. A. Electrolytic separation, etc., of constituents of metallic salts. 23,925. September 28.
Auer, L. Coagulation, etc., of products containing unsaturated carbon compounds. 24,226. September 30.
Austerweil, G. Manufacture of borneol, etc. 23,798. September 27. (Germany, September 25, 1925.)
Baddiley, J., British Dyestuffs Corporation, Hill, J., and Shepherdson, A. Manufacture of dyes for acetyl cellulose. 24,218. September 30.
British Celanese, Ltd., Ellis, G. H., Miller, W. B., and Olpin, H. C. Treatment of cellulose derivatives. 24,155. September 30.
British Dyestuffs Corporation, Chapman, E., Hollins, C., and Shepherdson, A. Aqueous sprays for dust, soil, etc. 24,219. September 30.
Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Oxidation of hydrogen sulphide. 23,814. September 27.
Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Manufacture of aromatic oxaminic acid halogenides. 24,187. September 30.
Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Process for vulcanising rubber. 24,188. September 30.
Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Manufacture of benzyl celluloses. 24,345. October 1.
Cassel Cyanide Co., Ltd., and Ewan, T. Manufacture of carbon from carbon monoxide. 24,372. October 2.
I. G. Farbenindustrie Akt.-Ges. Manufacture of esters. 23,790. September 27. (Germany, October 5, 1925.)
I. G. Farbenindustrie Akt.-Ges. Process for preparing Bz-2^1-hydroxybenzanthrone. 23,917. September 28. (Germany, September 28, 1925.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of motor fuels. 24,413. October 2. (Germany, October 19, 1925.)
I. G. Farbenindustrie Akt.-Ges. Manufacture of condensation-products of urea and formaldehyde. 24,298. October 1.
Lessing, R. Treatment of carbonaceous materials. 23,767. September 27.
Lessing, R. Process of distilling coal. 23,768. September 27.
Synthetic Ammonia and Nitrates, Ltd. Introducing liquids, etc., into high-pressure apparatus. 23,765, 23,766. September 27.
Synthetic Ammonia and Nitrates, Ltd. Treatment of carbonaceous materials. 23,940. September 28.
Tcherniac, J. Manufacture of ortho-anisidine, etc. 24,440. October 2.
Uhde, F. Synthesis of ammonia. 24,214. September 30. (Germany, October 2, 1925.)

Natural Sodium Compounds and Borates in 1925

THE production of sodium compounds, not including common salt, from natural salines and brines in the United States in 1925 amounted to 73,300 short tons, valued at $2,095,110. These figures show a decrease of 4 per cent. in quantity and an increase of 15 per cent. in value as compared with 1924. They cover the output of sodium carbonate, bicarbonate, sulphate, trona, and borate in various forms. The sales of sodium sulphate in 1925, comprising natural salt cake and Glauber's salt, were 9,940 tons, valued at $84,380, compared with 16,200 tons, valued at $174,600 in 1924. Trona, a double salt of sodium carbonate and sodium bicarbonate, was produced by the Natural Soda Products Co. at Keeler (Owens Lake) and by the American Trona Corporation at Trona (Searles Lake), California.

The boron minerals shipped in 1925 amounted to 113,700 tons, a decrease of 2 per cent. The value was $3,085,660. These include borax (sodium borate) and boric acid produced from natural brines at the plant of the American Trona Corporation, and colemanite (calcium borate), mined by the Pacific Coast Borax Co. and other companies.

Queensland Power Alcohol Scheme

MR. A. J. DRAPER (chairman of the Commonwealth Northern Power Alcohol Committee) recently stated that a cable had been received from the Distilleries Co., Ltd., of Edinburgh, approving of a tentative agreement made with that company five months ago. A conference was held during March in Cairns between Mr. Alex. Innes (Plane Creek Power Alcohol Co.), Messrs. A. V. Board and A. P. Minnell (representing the Distillers Co.) and Mr. A. J. Draper and S. H. Warner (members of the Northern Power Alcohol Committee). As a result it was agreed that a company be formed, to be called the Australian National Power Alcohol Co., with a capital of £1,000,000 and that distilleries be erected, the first one at Cairns, and later one at Townsville, while the Plane Creek (Mackay) Co.'s plant would be taken over by the A.N.P.A. Co. Mr. Board, after the conference, went to Scotland to lay the details before the board of directors of Distillers, Ltd., who were to furnish the plant. The formation of the A.N.P.A. Co. will proceed forthwith, the company being floated in Australia and registered as a company in Queensland. It is anticipated that distilling plants will be commenced as soon as the company is established, and the distillery at Cairns will be in operation next year. During the following year another distillery is to be erected at Townsville. The Plane Creek distillery will be taken over as it stands. It is expected for a start that the Cairns distillery will produce from 800,000 to 1,000,000 gallons of spirit per annum.

The American Copper Industry

FINAL statistics of the production of copper in the United States in 1924 and 1925 are issued by the Department of Commerce in a statement which has been compiled by the Bureau of Mines. The smelter production of copper from domestic ores showed a small increase in 1925 and established a new peace time production record. Refinery production from domestic sources also increased, but refinery production from foreign sources decreased sufficiently to make the total new refinery production for 1925 lower than that for 1924. Imports of unmanufactured copper and exports of metallic copper also decreased. Domestic withdrawals of new copper increased in 1925 and stocks of refined copper were only a little over one-half as large as stocks at the end of 1924. Blister stocks showed an increase. The average price of copper in 1925 was a little over 1 cent a pound higher than in 1924. A summary of copper statistics is published in Paper 1,411, but a more comprehensive report "Copper in 1925" is in preparation.

Lybian Potash Deposits

THE existence of large deposits of fertilising phosphates in the Italian colony of Cyrenaica has been definitely established by a scientific report received by the Italian Ministry of the Colonies. It is already known that Northern Africa is rich in phosphate deposits, and Commendatore Dessi, the director of one of the largest phosphate companies of Tunis, who was asked to explore Cyrenaica, says in his report that the deposits in the Italian colony are richer than the Tunisian. Italy, which formerly imported nearly half of the phosphates extracted from Tunis, to the value of about £1,000,000, will encourage the extraction of industrial phosphates in this new field to meet her ever-increasing demand for home consumption and export.

U.S.A. Trade in Barytes and Barium Products

STATISTICS compiled from reports made by American producers of barytes to the Bureau of Mines show sales amounting to 228,063 short tons, valued at $1,703,097 in 1925—a gain of 16 per cent. in quantity and of 10½ per cent. in value, as compared with 1924. While the total value of sales increased the average selling value f.o.b. at mine dropped from $7.85 to $7.47 a short ton. Sales of barium products reported by American producers in 1925 amounted to 213,347 short tons, valued at $17,434,378—an increase of 29 per cent. in quantity and 20 per cent. in value as compared with sales in 1924. Seven lithopone plants in the Middle Atlantic States and four plants in Illinois were operated during the year.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £37 per ton, Powder, £39 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s. d/d; Contract, £8 10s. d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystal, £23 per ton. Powder, £24 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 64 O.P.—Industrial, 2s. 5d. to 2s. 11d. per gall. Mineralised, 3s. 8d. to 4s. per gall., in each case according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 5d. per lb. Crude 60's, 1s. 4d. to 1s. 5d.

ACID CRESYLIC 99/100.—2s. 6d. per gall. 97/99.—2s. to 2s. 1d. per gall. Pale, 95%, 1s. 10d. to 2s. per gall. Dark, 1s. 9d. to 1s. 10d. per gall. Steady.

ANTHRACENE.—A quality, 2½d. to 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOL.—Crude 65's, 1s. 4d. to 1s. 5d. per gall., ex works in tank wagons. Standard Motor, 2s. to 2s. 3d. per gall., ex works in tank wagons. Pure, 2s. 3d. to 3s. per gall., ex works in tank wagons.

TOLUOL.—90%, 2s. to 3s. 3d. per gall. Pure, 2s. 3d. to 3s. 6d. per gall.

XYLOL.—2s. 3d. to 3s. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. per gall. Standard specification, 6¾d. to 7¼d. middle oil, 7d. to 7½d. per gall. Heavy, 8¼d. to 8½d. per gall.

NAPHTHA.—Crude, 10d. to 1s. 1d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 3d. per gall. Solvent 90/190, 1s. 3½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £4 10s. to £5 10s. per ton. Whizzed or hot pressed, £5 10s. to £7 10s.

NAPHTHALENE.—Crystals, £11 10s. to £12 10s. per ton. Flaked, £12 10s. to £13, according to districts.

PITCH.—Medium soft, 142s. 6d. to 150s. per ton, according to district.

PYRIDINE.—90/140, 16s. to 18s. per gall. Heavy, 7s. to 10s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. 6d. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—2s. 2d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—9½d. per lb. naked at works.

ANILINE SALTS.—9½d. per lb. naked at works.

BENZALDEHYDE.—2s. 1d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID—1s. 8½d. per lb.

o-CRESOL 29/31° C.—3d. to 3½d. per lb.

m-CRESOL 98/100%.—2s. 1d. to 2s. 3d. per lb.

p-CRESOL 32/34° C.—2s. 1d. to 2s. 3d. per lb.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. 2d. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. 3d. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—10d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 9d. per lb. 100% basis d/d.

o-TOLUIDINE.—9d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8. Grey, £17 10s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£7 to £9 per ton, according to grade and locality.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—9½d. to 1s. per gall.

WOOD CREOSOTE.—2s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 6d. per gall. 60% O.P. Solvent, 3s. 6d. per gall, 40% O.P.

WOOD TAR.—£3 to £5 per ton, according to grade.

BROWN SUGAR OF LEAD.—£39 to £40 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, 80% B.P.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity.

ACID, BORIC B.P.—Crystal, £43 per ton; Powder, £47 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 3½d. to 1s. 4½d. per lb.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d.

ACID, SALICYLIC.—1s. 3½d. to 1s. 5d. per lb. Technical.—10½d. to 11d. per lb.

ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.

ACID, TARTARIC.—1s. 0½d. per lb., less 5%. Market firm.

AMIDOL.—9s. 6d. per lb., d/d.

ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—11s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—8s. 9d. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—12s. 3d. to 14s. 3d. per lb.

BISMUTH CITRATE.—9s. 3d. to 11s. 3d. per lb.

BISMUTH SALICYLATE.—10s. to 12s. per lb.

BISMUTH SUBNITRATE.—10s. 6d. to 12s. 6d. per lb., according to quantity

BORAX B.P.—Crystal, £27; Powder, £28 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 9d. to 1s. 10d. per lb.; sodium, 2s. to 2s. 1d. per lb.; ammonium, 2s. 3d. to 2s. 4d. per lb., all spot.

CALCIUM LACTATE.—1s. 3d. to 1s. 5d.

CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—7s. to 7s. 6d. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. to 2s. 3d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 1d. to 2s. 4d. per lb.

IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.

MAGNESIUM CARBONATE.—Light Commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., according to quantity.

MENTHOL.—A.B.R. recrystallised B.P., 19s. 6d. net per lb.,; Synthetic, 10s. 6d. to 12s. 6d. per lb., according to quantity; Liquid (95%), 12s. per lb. Detached Cryst., 15s. 9d. per lb.

MERCURIALS.—Red oxide, 5s. 9d. to 6s. 4d. per lb.; Corrosive sublimate, 4s. to 4s. 8d. per lb.; white precipitate, 4s. 10d. to 5s. 2d. per lb.; Calomel, 5s. to 5s. 2d. per lb.; Yellow Oxide, 5s. 7d. to 5s. 8d. per lb.

METHYL SALICYLATE.—1s. 7d. per lb.

METHYL SULPHONAL.—15s. 6d. per lb.

METOL.—11s. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 9d. to 4s. per lb.

PHENAZONE.—5s. 9d. to 6s. per lb.

PHENOLPHTHALEIN.—4s. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—81s. per cwt., less 2½% for ton lots.

POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 6½d. per lb., spot.

QUININE SULPHATE.—2s. per oz., 1s. 8d. in 100 oz. tins.

RESORCIN.—4s. 3d. per lb., spot.

SACCHARIN.—55s. per lb.

SALOL.—3s. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb. B.P.C., 1923—2s. to 2s. 1d. per lb. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb. carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. to 80s. per cwt., according to quantity.

SODIUM SALICYLATE.—Powder, 1s. 9d. to 1s. 11d. per lb. Crystal, 1s. 10d. to 2s. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—10s. 6d. per lb.

TARTAR EMETIC, B.P.—Crystal or Powder, 1s. 11d. to 2s. per lb.

THYMOL.—12s. 6d. to 13s. 9d. per lb., according to quantity.

Perfumery Chemicals

ACETOPHENONE.—10s. per lb.

AUBEPINE (EX ANETHOL).—12s. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—5s. 6d. per lb.

AMYL SALICYLATE.—3s. 3d. per lb.

ANETHOL (M.P. 21/22° C.).—6s. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. 1d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. 1d. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 7d. per lb.

BENZYL BENZOATE.—2s. 4d. per lb.

CINNAMIC ALDEHYDE NATURAL.—18s. per lb.

COUMARIN.—11s. 6d. per lb.

CITRONELLOL.—15s. per lb.

CITRAL.—9s. 6d. per lb.

ETHYL CINNAMATE.—10s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—10s. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—6s. 3d. to 10s. 6d. per lb.

HELIOTROPINE.—5s. per lb.

ISO EUGENOL.—14s. 6d. per lb.

LINALOL.—12s. to 17s. per lb.

LINALYL ACETATE.—15s. to 18s. 6d. per lb.

METHYL ANTHRANILATE.—9s. 3d. per lb.

METHYL BENZOATE.—5s. per lb.

MUSK KETONE.—34s. per lb.

MUSK XYLOL.—8s. 3d. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—12s. per lb.

PHENYL ETHYL ALCOHOL.—10s. per lb.

RHODINOL.—30s. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—20s. 6d. per lb.

Essential Oils

ALMOND OIL.—11s. 6d. per lb.

ANISE OIL.—3s. 6d. per lb.

BERGAMOT OIL.—33s. per lb.

BOURBON GERANIUM OIL.—13s. 6d. per lb.

CAMPHOR OIL.—67s. 6d. per cwt.

CANANGA OIL, JAVA.—20s. per lb.

CINNAMON OIL, LEAF.—5½d. per oz.

CASSIA OIL, 80/85%.—9s. 3d. per lb.

CITRONELLA OIL.—Java, 85/90%, 2s. 7d. Ceylon, pure, 2s. 2d. per lb.

CLOVE OIL.—6s. 9d. per lb.

EUCALYPTUS OIL, 70/75%.—2s. per lb.

LAVENDER OIL.—French 38/40%, Esters, 18s. 6d. per lb.

LEMON OIL.—10s. 6d. per lb.

LEMONGRASS OIL.—4s. 6d. per lb.

ORANGE OIL, SWEET.—10s. 3d. per lb.

OTTO OF ROSE OIL.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.

PALMA ROSA OIL.—9s. 9d. per lb.

PEPPERMINT OIL.—Wayne County, 37s. 6d. per lb. Japanese, 11s. 9d. per lb.

PETITGRAIN OIL.—9s. per lb.

SANDAL WOOD OIL.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, October 7, 1926.

THE signs of renewed confidence which we reported last week are maintained, and there is every indication that the volume of business will materially expand as the industrial troubles are settled.

Prices are very firm and stocks are light. Export market is without special feature.

General Chemicals

ACETONE remains a quiet market, with demand far below normal; price nominal.

ACID ACETIC is in good demand; price unchanged at £37 per ton for technical and usual differences for other strengths.

ACID FORMIC is rather more active; price, 52s. per cwt. for small spot lots, can be shaded for quantities.

ACID LACTIC is quiet but price is firm at £43 per ton for 50% weight.

ACID OXALIC is in fair demand for export, but home trade is quiet; price unchanged at 3¾d. per lb.

ALUMINA SULPHATE is in fair demand on export account; the home market is now waiting for next year's prices.

AMMONIUM CHLORIDE is a quiet market at about £18 per ton in quantity.

BARIUM CHLORIDE is lower on Continental offerings, and is quoted £9 10s. per ton.

COPPER SULPHATE is unchanged.

EPSOM SALTS.—In good demand at about £5 10s. per ton.

FORMALDEHYDE is steady at £40 to £41 per ton; demand remains below normal.

LEAD ACETATE is an unsettled market, consequent upon second hand offers; price nominally £45 per ton for white and £43 for brown.

METHYL ACETATE is firm and advancing; price £55 per ton.

METHYL ALCOHOL.—There is no demand; price about £48 per ton.

POTASSIUM CHLORATE is firm at 3½d. per lb.

POTASSIUM PERMANGANATE.—Demand is only for small quantities; price 7½d. per lb. for B.P. grade.

POTASSIUM PRUSSIATE is in fair demand at 6¾d. per lb.

SODA ACETATE is in good demand, quoted at £19 15s. per ton.

SODA BICHROMATE is an active market; British makers' prices are unchanged.

SODA NITRATE.—Demand is quiet; price is firm at £20 10s. per ton.

SODA PHOSPHATE is unchanged.

SODA PRUSSIATE is quoted 3¾d. per lb.; a fair turnover is reported.

SODA SULPHIDE and ZINC SULPHATE are unchanged.

Coal Tar Products

Supplies of coal tar products are not any easier to obtain than last week.

90's BENZOL is quoted at 2s. 2d. per gallon on rails, while the motor quality is quoted at 2s. 1d. per gallon on rails.

PURE BENZOL is in very short supply, and is practically unobtainable, of British manufacture. It is worth about 4s. to 4s. 2d. per gallon.

CREOSOTE OIL has realised this week 8¼d. per gallon on rails at works in the country. The price in London is firm at 9¼d. to 9½d. per gallon at works.

CRESYLIC ACID.—There is considerable demand for both the pale and dark qualities, for delivery over the next two months. The pale quality, 97/99%, is worth about 2s. 2d. per gallon on rails, and the dark quality, 95/97%, 2s. 1d. per gallon on rails.

SOLVENT NAPHTHA in very small quantities is quoted at 1s. 10d. per gallon on rails.

HEAVY NAPHTHA is in very short supply, very little being obtainable in this country. It is worth about 1s. 6d. per gallon on rails.

NAPHTHALENES are increasingly scarce. The 76/78 quality is worth about £8 per ton on rails, and the 74/76 quality £7 10s. to £7 15s. per ton at makers' works.

Latest Oil Prices

LONDON.—LINSEED OIL quiet and 5s. to 7s. 6d. lower. Spot £30 10s., ex mill; October, £29 10s.; October-December and November-December, £29 12s. 6d.; January-April, £30 12s. 6d.; May-August, £30 17s. 6d. RAPE OIL quiet. Crude extracted, £46, ex wharf; technical refined, £48. COTTON OIL slow. Refined common edible, £40 10s.; Egyptian crude, £33 10s.; deodorised, £42 10s. TURPENTINE quiet and 3d. to 6d. per cwt. lower for near. American, spot, 64s.; November-December, 64s. 9d.; January-April, 66s. 3d.; and May-June, 65s. 9d.

HULL.—LINSEED OIL, spot, £30 12s. 6d.; October and November-December, £30 15s.; January-April, £30 17s. 6d.; May-August, £31 5s. COTTON OIL.—Bombay crude, £32 10s.; Egyptian crude, £33; edible, refined, £37; technical, £36. PALM KERNEL OIL.—Crushed naked, 5½ per cent., £40. GROUNDNUT OIL.—Crushed/extracted, £43 10s.; deodorised, £47 10s. SOYA OIL.—Extracted and crushed, £36; deodorised, £39 10s. RAPE OIL.—Crude/extracted, £45 10s.; refined, £47 10s. per ton. COD OIL.—Spot, 31s. 6d. per cwt., barrels, net cash terms, ex mills. CASTOR OIL unchanged.

Calcium Cyanamide

A GOOD deal of interest is being displayed in the use of this fertiliser for autumn application to winter corn crops and grassland. Calcium cyanamide contains 19 per cent. nitrogen and about 60 per cent. lime. As previously announced, the price to farmers for October delivery is £9 6s. per ton for 4-ton lots, carriage paid to any railway station in Great Britain.

Nitrogen Products

Export.—During the past week the sulphate of ammonia position has changed very little. As only small lots continue to be available in the United Kingdom, British producers are selling on the basis of £11 to £11 2s. 6d. per ton f.o.b. The usual autumn inquiries are coming in from several countries.

Home.—The home position remains unchanged. British producers are selling on the basis of £11 9s. per ton delivered to consumer's nearest station. The prompt demand is small. The bulk of the production until the end of the year of several makers has been taken up by mixer contracts.

Nitrate of Soda.—Little fresh interest is shown in this commodity. The demand in the United States continues to be large, but in Europe and Egypt there is little interest. It is expected that from now on the nitrate position will improve. Small sales are taking place at scale prices.

Export of Pitch Prohibited

THE Board of Trade have issued the following Order, dated October 5, prohibiting the export of pitch:—

The Board of Trade, in exercise of the powers conferred upon them by the Emergency Regulations (No. 6), 1926, and of all other powers enabling them in that behalf, hereby order as follows: (1) The shipment of pitch for exportation, except under such conditions as the Board of Trade may by their licence allow, is hereby prohibited. (2) This order may be cited as the Pitch (Emergency: Prohibition of Export) Order, 1926. Copies of the Order may be purchased from H.M. Stationery Office.

The Coal, Chemical and Engineering Exhibition

THE National Coal Products, Chemical and Engineering Exhibition organised by the Manchester Section of the Society of Chemical Industry, to run concurrently with the Tar Symposium, which is to be held in Manchester on November 26, will be held in the City Hall, Manchester, from November 16 to November 27, and will comprise not only exhibits from a large number of firms manufacturing plant for the coal and allied industries, but also representative exhibits of the scope and work of chemical industry in this country. Among the exhibitors will be the following: West's Gas Improvement Co. (vertical gas retort installations); Sir W. H. Bailey and Co. (pumps and compressors); The British Road Tar Association; Hardman and Holden (coal-tar products); George Kent and Co., Ltd. (boiler plant control appliances); Electroflo Meters Co., Ltd. (boiler plant control appliances); The Croswaithe Engineering and Furnaces Co., Ltd. (furnaces); Bolton's Superheaters and Pipe Works, Ltd. (superheaters, etc.); Thos. Broadbent and Sons, Ltd. (centrifugals); Spencer, Bonecourt and Co., Ltd. (gas-fired boiler in operation); Nobel Industries, Ltd. (commercial explosives, etc.); G. and J. Weir, Ltd. (Monel metal in various forms); The Thermal Syndicate, Ltd. (silica ware); The Salt Union, Ltd. (chemical products); Varcoes China Clays, Ltd. (China Clays, whiting, etc.); The Fuel Research Board; and various University Fuel Departments.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, October 6, 1926.

THE heavy chemical market still remains very quiet, any inquiry there is being for small quantities. Prices remain practically unchanged.

Industrial Chemicals

ACID ACETIC, 98/100%.—£55 to £67 per ton, according to quality and packing, c.i.f. U.K. port; 80% pure, £39 to £41 per ton; 80% technical, £38 to £39 per ton, c.i.f. U.K. ports.

ACID BORIC.—Crystal, granulated or small flakes, £37 per ton; powdered, £39 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand and now quoted 5½d. per lb., delivered or f.o.b. U.K. port, but this could probably be shaded.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at 1s. 3d. per lb., less 5% ex store. Offered for early shipment at 1s. 2⅞d. per lb., less 5% ex wharf.

ACID HYDROCHLORIC.—In little demand. Price 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Usual steady demand and price unchanged at £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Quoted 3¾d. per lb., ex wharf, early delivery. Spot material on offer at 3⅝d. per lb., ex store.

ACID SULPHURIC.—144°, £3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads; dearsenicated quality 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—Unchanged at 11⅞d. per lb., less 5%, ex store. Offered for prompt shipment at 11½d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18% IRON FREE.—Spot material on offer at about £6 per ton, ex store. Quoted £5 8s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent.

ALUM, LUMP POTASH.—On offer from the Continent at £7 15s. per ton, c.i.f. U.K. ports. Spot material quoted £9 per ton, ex store. Crystal powder, £8 5s. per ton, ex store, or £7 12s. 6d. per ton, c.i.f. U.K. port.

AMMONIA ANHYDROUS.—Imported material selling at about 11¼d. to 11½d. per lb., ex wharf, containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £23 10s. to £25 10s. per ton, ex station. Continental on offer at about £21 10s. per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £18 5s. per ton, c.i.f. ports.

ARSENIC, WHITE POWDERED.—In better demand and prices advanced to about £17 10s. per ton, ex wharf, prompt despatch from mines. Spot material quoted £18 per ton, ex store.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Quoted £9 12s. 6d. per ton, ex store, spot delivery. On offer from the Continent at about £8 17s. 6d. per ton, c.i.f. U.K. ports.

BARYTES.—English material unchanged at £5 5s. per ton ex works. Continental quoted £5 per ton c.i.f. U.K. ports.

BLEACHING POWDER.—English material unchanged at £9 10s. per ton, ex station. Contracts 20s. per ton less. Continental now quoted £7 15s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £22 10s. per ton; crystals, £23 per ton. powdered, £24 per ton, carriage paid U.K. stations.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or at £4 2s. 6d. per ton, f.o.b. U.K. port, for export.

COPPER, SULPHATE.—Continental material on offer at about £22 per ton, ex wharf. Moderate inquiry for export and price of English material about £23 5s. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Quoted, £38 per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at £40 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material quoted £38 per ton, ex store.

LEAD, WHITE.—Quoted £38 10s. per ton, ex store.

LEAD ACETATE.—White crystals quoted £44 10s. per ton, c.i.f. U.K. ports, prompt shipment. Brown about £40 5s. per ton, c.i.f. U.K. ports.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH CAUSTIC, 88/92%.—Syndicate prices vary from £25 10s. to £28 15s. per ton, c.i.f., U.K. ports, according to quantity and destination. Spot material available at about £29 per ton.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb. delivered.

POTASSIUM CARBONATE.—96/98% quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store; 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Powdered quality on offer from the Continent at about £25 10s. per ton, c.i.f. U.K. ports; crystals £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—Spot material quoted £24 per ton, ex store. On offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—On offer at 7d. per lb., ex store, spot delivery. Quoted 6¾d. per lb., ex wharf, early shipment.

POTASSIUM PRUSSIATE, YELLOW.—Unchanged at about 6⅞d. per lb., ex store, spot delivery. On offer from the Continent at about 6¾d. per lb., c.i.f. U.K. ports.

SODA CAUSTIC.—76/77% at £17 10s. per ton; 70/72, £16 2s. 6d. per ton; broken 60%, £16 12s. 6d. per ton; powdered 98/99%, £20 17s. 6d. per ton. All carriage paid, U.K. stations, spot delivery. Contracts 20s. per ton less.

SODIUM ACETATE.—English material quoted £22 per ton, ex station. Cheaper offers from the Continent now quoted £19 per ton, c.i.f. U.K. ports, early delivery.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—English price unchanged at 3½d. per lb., delivered.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, £1 7s. 6d. per ton more. Alkali, 55%, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted at £9 per ton, ex station, minimum 4 ton lots. Pea crystals £14 10s., ex station. Continental commercial quality on offer at £8 15s. per ton, ex store, spot delivery.

SODIUM NITRITE, 100%.—Quoted £20 17s. 6d. per ton, ex store, spot delivery.

SODIUM PRUSSIATE (YELLOW).—In rather better demand and some merchants asking 4d. per lb., ex store. Offered to come forward at 3⅞d. per lb., c.i.f. U.K. ports.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 10s. per ton, ex works. Good inquiry for export and higher prices obtainable.

SODIUM SULPHIDE.—60/62% solid, £13 5s. per ton; broken, £14 5s. per ton; flake, £15 5s. per ton; crystals, 31/34%, £8 12s. 6d. per ton. All delivered buyers' works, U.K., minimum 5 ton lots, with slight reduction for contracts. 60/62% solid quality offered from the Continent at about £8 15s. per ton, c.i.f. U.K. ports. Broken quality 15s. per ton more. Crystals 30/32%, about £6 10s. per ton, c.i.f. U.K. ports.

SULPHUR.—Flowers, £11 10s. per ton; roll, £10 5s. per ton; rock, £10 5s. per ton; floristella, £9 15s. per ton; ground American, £9 per ton, ex store, spot delivery. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports. 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton extra.

ZINC SULPHATE.—Continental make on offer at about £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

ALPHA NAPHTHOL.—2s. per lb. Some home inquiries.

SODIUM NAPHTHIONATE.—1s. 8d. to 1s. 9d. per lb., 100%. Fair home inquiries.

H. ACID.—3s. 3d. per lb., 100%. Small home inquiries.

PHENYL PERI ACID.—3s. 9d. per lb., 100%. Some home inquiries.

HEYL-BERINGER FARBENFABRIKEN A.-G., Berlin, is the style under which the recently amalgamated German companies Gebrüder Heyl and Co. and A. Beringer G.m.b.H. will operate. The two firms mentioned were especially interested in the manufacture of mineral colours.

SWISS CHEMICAL EXPORTS for August, 1926, were as follows, figures for August, 1925, being shown in brackets: — Aniline dyes, francs 4,516,000 (3,738,000); alkaloids, francs 1,405,700 (636,700); other chemical-pharmaceutical preparations, francs 368,500 (362,600).

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, October 7, 1926.

The chemical trade is meeting with nothing like the demand for its products for home consumption purposes that it should be doing, although a rather better feeling is noticeable in the case of one or two items. On the export side a moderate inquiry is reported, but so far as actual business is concerned only a limited number of orders are being placed for shipment, Canada, Australia, and the East being responsible for the majority of them, with the Continent doing very little. In spite of the restricted business on this market prices are keeping quite steady.

Heavy Chemicals

In the case of caustic soda the price position is unchanged, quotations being firmly maintained at from £15 2s. 6d. to £17 10s. per ton, according to quality, and the demand keeping up to its recent level. Prussiate of soda, although a quiet section of the market, remains steady at about 3⅞d. to 4d. per lb. Sulphide of soda is slow and quotations are displaying some easiness, with commercial crystals on offer at £8 5s. per ton and 60-65 per cent. concentrated solid at round £10. Bleaching powder is still on offer at £8 10s. per ton, with business on a moderate scale. Hyposulphite of soda is rather dull, commercial quality being quoted at round £9 10s. per ton and photographic crystals at £15 5s. Bicarbonate of soda is steady and meets with a quiet demand at about £10 10s. per ton. Nitrite of soda is being offered at round £19 5s. per ton and a somewhat better feeling has been reported this week. Alkali, 58 per cent. material, is receiving some attention at about £6 15s. per ton. The demand for chlorate of soda is limited, and prices are perhaps a shade easier at 3½d. to 3¼d. per lb. Glauber salts remain a relatively slow section of the market, but values show little change at about £3 15s. per ton. Salt-cake is in much the same position, with quotations round £3 5s. per ton. Bichromate of soda is steady and in moderate request at 3¼d. per lb. Phosphate of soda is quiet but unchanged at about £12 5s. per ton.

There is some inquiry reported for caustic potash, which keeps fairly steady at about £27 per ton. There is not much call for yellow prussiate of potash, but values have shown little appreciable change, about 6¾d. per lb. still being quoted. Bichromate of potash, if anything, is rather easy, 4d. to 4¼d. per lb. being asked in connection with the very limited business that has been done this week. Chlorate of potash is steady and in quiet demand at 3⅝d. per lb. There seems to be comparatively little call for permanganate of potash, with B.P. quality quoted at 6¾d. per lb. and commercial at 5d. to 5¼d. Carbonate of potash is being offered at £25 10s. to £26 per ton, with demand on moderate lines.

Sulphate of copper continues to receive some attention, and for shipment prices show little change on the week at £22 10s. to £23 per ton, f.o.b. A steadier tone about arsenic is to be reported and sales are better, with current quotations ranging from £14 to £14 10s. per ton for white powdered, Cornish makes. Acetate of lime is in limited request, but values have shown little alteration, grey acetate offering at £17 to £17 10s. per ton and brown at about £8. Acetate of lead is also steady at £45 10s. per ton for white and £41 for brown. Nitrate of lead meets with a moderate amount of inquiry, with prices this week running from £40 to £41 per ton.

Acids and Tar Products

Little change in prices in the case of the acids has occurred since last week. There is very little activity in respect of oxalic acid, but values still range from 3½d. to 3⅝d. per lb. There is the usual quiet trade being put through in acetic acid, with glacial on offer at £65 to £66 per ton and 80 per cent. commercial quality at about £37 per ton. Interest in tartaric acid is subdued, but up to 11¾d. per lb. is still being asked. Citric acid is in quiet demand with supplies offering at 1s. 3d. to 1s. 3¼d. per lb.

Export business in pitch is being quoted this week at about £7 15s. per ton f.o.b., with offers very scarce. Creosote oil is also firmer and in very short supply at about 8½d. per gallon. Crystal carbolic acid is steady at 5½d. per lb., with cresylic acid very firm at 2s. 10d. to 3s. per gallon. Solvent naphtha remains steady but about unchanged at 1s. 10d. to 1s. 11d. per gallon.

Pyrites in Coal

At one time it was believed that spontaneous combustion in coal mines was due solely to the heat generated by the oxidation of iron pyrites present in the coal, and, while modern research has shown that the phenomenon is most often traceable directly to the oxidation of the coal substance by the air, there seems little doubt that the presence of pyrites may sometimes be a contributory or even a determining factor. An account of an examination of the various types of pyrites occurring in coal, with a view to determining their composition and to identifying those types which oxidise rapidly, is contained in a paper entitled "Pyritic Oxidation in Relation to the Spontaneous Combustion of Coal," by H. Macpherson, N. Simpkin and S. V. Wild, of the research staff of the Lancashire and Cheshire Coal Research Association. (Safety in Mines Research Board Paper No. 26, H.M. Stationery Office, Adastral House, Kingsway, London. Price 1s. net.) A laboratory study has been made of the rates at which varieties of pyritic material oxidise and of the character of the products formed, and the results have been correlated with observations on the behaviour of the material *in situ* in the mine. The results emphasise the importance that must be attached to the mode of existence of pyrites when considering its probable influence on the spontaneous combustion of coal.

Need of Synthetic Fuel

Mr. H. Kerr Thomas delivered his presidential address to the Institution of Automobile Engineers on Tuesday on "The Debt of the Community to the Automobile." Speaking in the course of his address on the production of synthetic fuel to replace petrol or other petroleum products in use to-day, Mr. Thomas said that in 1920 the chief engineer of the London General Omnibus Co. asked the British Government to promote the sale of an alcohol-petrol mixture as the national fuel of this country. That two other European countries—Italy and Germany—should now have forestalled us in this was a matter for regret. The reason always advanced in official circles in England was that the fiscal arrangements introduced insuperable difficulties to the use of alcohol. Other countries, it would seem, had means of overcoming these alleged difficulties, and the sooner it could be done in England the quicker would the country be able to embark on another great industry to meet the demands of the motor-car.

Increased Production of Mica in 1925

The total quantity of uncut mica sold by producers in the United States in 1925, as reported by the Bureau of Mines, was 10,592 short tons, valued at $495,499. Of this quantity 897 tons (1,793,865 pounds), valued at $321,962, was sheet mica; the rest was scrap mica. The total sales of uncut sheet mica in 1925 showed an increase of 23 per cent. in quantity and 52 per cent. in value, as compared with 1924. The total quantity of scrap mica sold was more than twice that of 1924, and the value was nearly twice as much. The average value per pound of sheet mica sold in the United States in 1925 was about 18 cents, and the average value of scrap mica a short ton was about $18. The imports of mica for consumption were 4,901,308 lb., valued at $1,798,827. Corresponding figures for 1924 were 5,801,151, valued at $2,326,906.

The Casale Process

It is stated that the total capacity of plants producing synthetic anhydrous ammonia under licences of the Swiss Company Ammonia Casale, with headquarters at Lugano, at the end of May was 135½ metric tons of anhydrous ammonia per 24 hours, while the potential capacity of plants under construction throughout the world at that time was 539 metric tons of anhydrous ammonia. Large new units are under construction in France, Japan, Russia and England. The former Societa Italiana Ammonica Sintetica has been absorbed by the Societa Terni, which is now operating the plant at Nera Montoro. Dr. Casale has taken over the small original plant at Terni, under the name of the Societa Italiana Ricerche Industriali, where he is engaged in carrying on further research.

Company News

RECKITT AND SONS.—The company announces an interim dividend of 3¾ per cent., less tax, on the ordinary shares.

TAYLORS DRUG CO.—A dividend at the rate of 6 per cent. per annum for the past half year is announced on the preference shares.

NITRATE RAILWAYS, LTD.—The directors have declared an interim dividend of 3s. per share on the ordinary and preferred ordinary capital.

BRITISH PORTLAND CEMENT MANUFACTURERS, LTD.—The directors have declared an interim dividend on the ordinary shares of 5 per cent. actual, less tax, payable on October 14.

GENERAL MINING AND FINANCE CORPORATION, LTD.—A dividend of 7½ per cent. (1s. 6d. per share) is payable to all shareholders registered on October 16, and dividend warrants will be posted on December 1 next.

THE ANTOFAGASTA (CHILI) AND BOLIVIA RAILWAY CO., LTD.—An interim dividend of 3 per cent., less tax at 4s. in the £, is announced on the consolidated ordinary stock on account of the year 1926, payable on November 1.

BORAX CONSOLIDATED, LTD.—A dividend has been declared at the rate of 6 per cent. per annum, less tax at 4s. in the £, on the preferred ordinary shares in respect of the half year ended September 30, 1926. Coupon No. 38 of the preferred ordinary share warrants to bearer will be paid, less tax, on and after November 1, at 16, Eastcheap, London.

BELL'S UNITED ASBESTOS CO., LTD.—The directors have declared an interim dividend on the ordinary shares of 6d. per share, being 2½ per cent. (actual) less income tax, on account of the current year. The dividend will be paid on October 18 to shareholders on the register on October 4, and the ordinary share transfer books will be closed from October 4 to 16, both dates inclusive.

NEW TRANSVAAL CHEMICAL CO., LTD.—At an extraordinary general meeting of the company held on October 1, at Winchester House, Old Broad Street, London, a resolution was passed confirming the alterations in the Articles of Association rendered necessary by the agreement between the company and Associated Enterprises, Ltd., and unanimously approved at the extraordinary general meeting of the company held on September 15 last. One of the new articles provided that while Lever Brothers, Ltd., held not less than 250,000 ordinary shares they should be entitled to appoint up to four directors of the company, and that under such circumstances not more than three directors not elected by Lever Brothers, Ltd., should hold office.

ANGLO-CONTINENTAL GUANO WORKS, LTD.—The net profit for the year ended June 30 last, after providing for all trade charges, directors' fees, taxation and doubtful debts, amounts to £30,613, to which is added the balance brought forward (£5,828), making in all £36,441. After payment of debenture interest for the year amounting to £10,442, there is a credit balance of £25,999 to be dealt with. Of the available profits the directors propose to apply £9,000 in payment of one-half year's dividend on the preference shares, less tax; to transfer £10,000 to depreciation reserve fund, bringing the fund up to £35,000; to set aside £2,250 for sinking fund for redemption of debenture stock, and to carry forward £4,749. The annual meeting will be held at the Cannon Street Hotel, London, on October 11, at 12 noon.

Tariff Changes

NIGERIA.—An Order in Council dated August 3 provides that the importation of cyanide of potassium and all poisonous cyanides and their preparations may only be effected under licence and subject to certain conditions specified by the Order, such as the retention of the duplicate copy of the licence and the keeping of the necessary records of the consignments. The Order applies to the British Cameroons as well as to the rest of the Protectorate and the Colony.

BRAZIL.—Article 2 of the Brazilian Budget Law for 1926 provided for the levy of a tax of from 1 to 5 reis per kilog. on merchandise loaded or discharged in Brazilian ports.

HUNGARY.—With reference to previous notices publishing lists of goods requiring certificates of origin on importation into Hungary, it should be noted that these lists have been materially curtailed by an Ordinance (No. 120,340/1926), dated September 6. Among articles which now require certificates of origin are: chemically homogeneous medicaments put up for retail trade in ampoules or tablets, and other prepared medicaments or remedies.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us by Mr. H. T. P. Gee, Patent and Trade Mark Agent, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to November 6, 1926.

"TAROLITE."

472,982. For chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. Class 2. The Strawson Chemical Co., Ltd., 79, Queen Victoria Street, London, E.C.4; wholesale and export chemists. September 11, 1926.

"ALBONO."

472,374. Chemical substances prepared for use in medicine and pharmacy. Class 3. Stotherts, Ltd., Albion Works, North Road, Atherton, Lancashire; manufacturing chemists. August 19, 1926. (To be Associated. Sect. 24.)

"MULIERINE."

472,425. Chemical substances prepared for use in medicine and pharmacy. Class 3. Society of Chemical Industry in Basle (a joint stock company organised under the laws of the Swiss Republic), 141 to 227, Klybeckstrasse, Basle, Switzerland; manufacturers and merchants. August 20, 1926.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

AGENT'S SERVICES OFFERED.—A commission agent in Porto Alegre, Brazil, is desirous of getting into touch with a British firm of general merchants interested in the appointment of a representative on a commission basis for the State of Rio Grande do Sul. (Reference No. 459.)

AGENT'S SERVICES OFFERED.—A well-known New Zealand business man, who is shortly relinquishing the general managership of a large concern in Wellington, desires to represent a substantial British firm in the Dominion or to secure British agencies. Personally known to the High Commissioner for New Zealand, from whom further information is obtainable. Apply, New Zealand Government Offices, 415, Strand, London, W.C.2, quoting Reference P.D. 1.

ONE HIGH PRESSURE WATER TUBE BOILER COMPLETE.—The Officer-in-Charge of H.M. Trade Commissioner's Office at Melbourne has forwarded specification relative to a call for tenders by the State Electricity Commission of Victoria for the manufacture, testing, supply, and delivery in every way complete for the superintendence and erection, testing, and putting into service at the site, and also maintenance at the site, of one high pressure water tube boiler with superheater economiser, step grates, piping, valves, dampers, platforms, ladders, mountings and fittings, etc., to make a complete unit (Specification No. 26/82). Tenders close on December 15, 1926. The specification can be seen by British firms at the Department of Overseas Trade (Room 50), 35, Old Queen Street, London, S.W.1, until October 8, and a copy will be sent on loan, in order of application, to firms unable to arrange for inspection in London. (Reference A. 3660.)

Hadfields and the Coal Shortage

SHEFFIELD steel works are now being seriously affected by the shortage of coal. Hadfields, Ltd., announce that, owing to the shortage of fuel caused by the restriction of the supply of continental coal, they will have to close down this week. This means that 5,000 men will be out of employment. Brown Bayleys are also seriously affected, and this week work will be considerably restricted.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgment

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

SHARPLES, Percy, 5, Hyndburn Street, Accrington, and GILLIARD, Sydney G., 14, Christ Church Street, Accrington, manufacturing chemists. (C.C., 9/10/26.) £15 2s. 8d. August 26.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an—followed by the date of the Summary, but such total may have been reduced.]*

BIOZONE, LTD., London, E.C., chemical manufacturers. (M., 9/10/26.) Registered September 24, £600 debentures (filed under section 93 (3) of the Companies (Consolidation) Act, 1908), present issue £335; general charge. *Nil. January 13, 1926.

HADFIELD (GEORGE) AND CO., LTD., Liverpool, chemical manure manufacturers. (M., 9/10/26.) Registered September 21, £15,000 charge (ranking in priority to previously registered charges), to Bryant and May, Ltd., Fairfield Works, Bow; charged on match factory, etc., Lightbody Street, Liverpool. *£65,000. March 23, 1926.

London Gazette, &c.

Companies Winding Up Voluntarily

HULSE (DYES), LTD. (C.W.U.V., 9/10/26.) C. C. Murgatroyd, of Murgatroyd and Co., accountants, 1, Cookridge Street, Leeds, appointed liquidator, September 20. Meeting of creditors at the Leeds Law Institute, 1, Albion Place, Leeds, on Friday, October 15, at 2 p.m.

SUN BLEACHING CO., LTD. (C.W.U.V., 9/10/26.) By, special resolution, August 30, confirmed September 20, E. O. Mosley, 16, Bolton Street, Bury, chartered accountant, liquidator.

Bankruptcy Information

FREEMAN, John William, 12A, Park Row and Bradshawfield Mill, Bread Street, Bolton, chemical manufacturer. (R.O., 9/10/26.) Receiving order, September 27. Debtor's petition.

Partnership Dissolved

BATCHELOR DOCTOR CASEIN WORKS (George Henry Rabardy BATCHELOR and Ardeshir Hirajee DOCTOR), importers and exporters, grinders, refiners, and treaters of casein and manufacturers of and dealers in scouring and washing powder, 132, Southwark Street, S.E.1, by mutual consent as from September 24, 1926. Debts received and paid by A. H. Doctor, who will continue the business.

New Companies Registered

CLYDE HEAT TREATMENT CO., LTD., 100, Clarence Street, Glasgow. Registered in Edinburgh on October 1. Nom. capital, £1,000 in £1 shares. To carry on the business of heat treatment of iron and steel and non-ferrous metals, refiners of ores, etc. Directors: G. Hopkins and W. Nelson, 167, Hill Street, Garnethill, Glasgow.

REGAL PETROLEUM PRODUCTS, LTD., 6 and 7, Coleman Street, London, E.C.2. Registered October 4. Nom. capital, £500 in £1 shares. To carry on the business of buyers, sellers, storers, transporters, manufacturers, distillers, refiners, or treaters of petroleum, crude and refined oils, shale, coal, ironstone, fireclay, and other minerals, sulphate of ammonia, etc. Directors: G. Howell, 68, Beulah Hill, Upper Norwood, S.E.19, and A. W. Somers.

THE SUN BLEACHING CO., LTD., Blackfriars House, Parsonage, Manchester. Registered as a "private" company on September 24. Nom. capital of £100 in £1 shares. The objects are to adopt an agreement with the Bleachers' Association, Ltd., and to carry on the business of bleachers, dyers, finishers, dressers, and chemical manufacturers, etc. Directors: H. Allen, Firwood Hall, Bolton, A. K. Davies, F. Whowell, Sir Wm. C. Lees, and E. C. C. Hunter.

Chemistry and Australian Development.

THREE appointments to the Australian Development and Migration Commission have been announced by the Commonwealth Prime Minister. The measure creating the Commission provides for a membership of four, but the fourth position is not yet filled. Mr. H. W. Gepp (chairman); Mr. C. S. Nathan, of Perth (vice-chairman); and Mr. J. Gunn, Premier of South Australia, are the three selected commissioners. Mr. H. W. Gepp, the general manager of the Electrolytic Zinc Co., has been appointed as the chairman of the commission for a period of seven years, at a salary of £5,000 a year. He was in the employment of the Australian Explosives and Chemical Co., Deer Park, Victoria, and later Nobel's Explosives Co., from 1895 to 1904, as chemist, and later as manager of the works, making mining and munition explosives, acids and superphosphates. Mr. Gepp spent one year and a half at Nobel's works on the Clyde in 1897–8, and was also with De Bavay's Treatment Co., and later Amalgamated Zinc (De Bavay's), Ltd., Broken Hill, as manager and later as general manager, 1905–1916. During 1915–16, he was in North America on metal and munition work, acting for the Commonwealth Government on munition matters. From 1916, Mr. Gepp has been general manager of Electrolytic Zinc Co. of Australasia, Ltd. During the whole of this period he was engaged in assisting in the development of this company's large undertaking, which include the production of munition zinc, cadmium, sulphuric acid, and superphosphate. In 1924 Mr. Gepp was made president of the Australasian Institute of Mining and Metallurgy, and represented Australia and New Zealand in London in 1924 at the Empire mining and metallurgical congress. He was also one of the delegates appointed by the Commonwealth to the world power conference. In 1924 he was awarded, together with Mr. Gilbert Rigg, the highest honour of the Institute of Mining and Metallurgy—a gold medal—in recognition of special work in connection with treatment of complex ores, and with special reference to the production of electrolytic zinc in Australia.

Gypsum Production in U.S.A.

THE gypsum industry was highly productive in 1925, according to a statement made public by the U.S.A. Bureau of Mines. The quantity of gypsum mined in 1925 was 5,678,302 short tons, which is the largest output ever recorded for America and exceeds that of 1924 by more than 600,000 tons, or nearly 13 per cent. The value of the sales of both crude and calcined gypsum was $47,893,573, an increase of more than $5,000,000, or 12 per cent., compared with 1924. Over 1,000,000 tons was sold crude and 4,104,735 tons was sold calcined. The value of the gypsum sold crude was $2,823,229, or $2·78 per ton, and the value of that sold calcined was $45,070,344 or $10·98 per ton. New York is the largest producer of gypsum. The production of crude gypsum in that State in 1925 was 1,730,254 short tons—30 per cent. of the entire output—an increase of 17 per cent. compared with 1924. It was also the largest seller of crude and calcined gypsum, 354,394 tons of the former (or 35 per cent. of the total) and 1,193,520 tons of the latter (or 29 per cent. of the total) being marketed in New York in 1925. These were considerable increases over 1924. Other important States in the production of crude gypsum were: Iowa, 800,167 tons; Michigan, 649,053 tons; Texas, 558,132 tons; and Ohio, 551,479 tons. These five States reported nearly 76 per cent. of the total.